

THE LONG ISLAND SOUNDER



Long Island
Chapter

2023-2024

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PRESIDENT'S MESSAGE



Introduction

The ASHRAE LI chapter is continuing the energy and effort to continue our strong start in September. The board members and committee chairs met ahead of the dinner presentation to discuss upcoming programs, joint meetings with other industry professionals, spring field trip, sustainability forums at local universities, government outreach, research promotion milestones, membership promotion/retention, and upcoming YEA events.

Recognition

A SPECIAL THANK YOU to Mr. Siegelson (Senior Engineer, ADE) for presenting at the January meeting on Humidification and Psychrometry.

Past Events

The ASHRAE LI chapter had a great turnout at the December 5th YEA Event at Great South Bay Brewery which included a tour of the facility and the refrigeration equipment and procedures involved to create the beverage enjoyed by millions around the world.

Communication

Our chapter continues to utilize and observe a positive impact utilizing online tools more effectively. Through our social media accounts, we frequent update with upcoming YEA events, joint meetings and network opportunities.

Upcoming Events

The LI ASHRAE Chapter and LI ASPE Chapter will be holding the first LI HVAC and Plumbing Trade Show. There will be 30 manufacturer's representatives who cover hundreds of manufacturers. The event is free for attendees. Please refer to the flyer for additional details.

The LI ASHRAE Chapter will be visiting Delta Sheet Metal for a tour of their factory on Wednesday, February 21st from 6-9pm.

Member Involvement

As our organization is completely volunteer, I urge all who are interested in becoming involved in our organization to please reach out to myself or any of the board members. There are endless of opportunities network, volunteer and grow as an individual.

- M.Nigro

Long Island Chapter President

ASHRAE LI CHAPTER'S ANNUAL FIELD TRIP



PJ MECHANICAL'S DELTA SHEET METAL SHOP



Date: Wednesday February 21st, 2024

Time: 6:00 – 8:00PM

Where: Delta Sheet Metal

940 S Oyster Bay Rd, Bethpage, NY 11714

*** Food and Beverages will be provided ***

Registration Link: <https://www.ashraeli.com/young-engineers-events.html>

Chapter Monthly Meeting - Program for 2023/2024

<p>September 12, 2023* <i>At Westbury Manor</i></p> <p>Dinner Presentation – Smart Campuses: New Adaptations of Chilled Water Optimization Demand Flow Technology Strategies</p> <p>Presenter: Mark Benevides & Andrew Kozak</p> <p style="text-align: right;">**1 PDH**</p>	<p>March 13, 2024 <i>* At Westbury Manor</i></p> <p>Dinner Presentation— TBA</p> <p style="text-align: right;">**1 PDH**</p> <p>Student Activities Night YEA Night</p>
<p>October 10, 2023* <i>At Westbury Manor</i></p> <p>Dinner Presentations - Domestic Hot Water Heat-Pump— Challenges and Solutions</p> <p><i>Presented by: Scott Shufflebotham</i> Sales Engineer, Daikin Applied</p> <p style="text-align: right;">**1 PDH**</p>	<p>April 10, 2024</p> <p>Dinner Presentation— TBA</p> <p style="text-align: right;">**1 PDH**</p>
<p>November 14, 2023 <i>* At Westbury Manor</i></p> <p>Dinner Presentation— System Air Leakage Test Standard</p> <p>Presented by: William C. Farrell II Senior Project Manager for SMACNA</p> <p style="text-align: right;">**1 PDH**</p> <p>Membership Promotion Student Activities Night and YEA Night Resource Promotion Night</p>	<p>May 2024 <i>* Cherry Valley Club, Garden City, NY</i></p> <p>ANNUAL GOLF OUTING</p>
<p>December 12, 2023 <i>* At Westbury Manor</i></p> <p>Dinner Presentation— Future of Refrigerants</p> <p>By: Steve Kujak</p> <p>**1 PDH**</p>	<p>May 15, 2024</p> <p>Annual Field Trip—TBA</p>
<p>January 9, 2024 <i>* At Westbury Manor</i></p> <p>Dinner Presentation— Humidification By: Andy Siegelson</p> <p>**1 PDH**</p>	<p>June 12th 2024 <i>* At Westbury Manor</i></p> <p>Free Buffet Dinner for Members</p> <p>PAST PRESIDENTS NIGHT & OFFICER INSTALLATION STUDENT SCHOLARSHIPS TO BE AWARDED ASHRAE History Quiz and prize Give-A-Ways</p>
<p>February 13, 2024</p> <p>Dinner Presentation— What could possibly be new with fin tube, convectors, cabinet heaters, and fan coils?</p> <p>By: John Knowles</p>	<p>July 2024- TBD (4pm-8pm) <i>* Dixie II @ Captree State Park Boat Basin, NY</i></p> <p>ANNUAL FISHING TRIP</p>
<p>February 20, 2024 <i>* At Westbury Manor</i></p> <p>Dinner Presentation— TBA</p> <p style="text-align: right;">**1 PDH**</p> <p>Membership Promotion Night Resource Promotion Night</p>	<p>August 2024</p> <p>CHAPTERS' REGIONAL CONFERENCE (CRC) REGION I GRANIT STATE</p>
<p>February 20-26, 2024</p> <p>NATIONAL ENGINEERS WEEK</p>	

Long Island Chapter Officers & Committees

ASHRAE 2023/2024

OFFICERS

POSITION	NAME	EMAIL
President	Michael Nigro	c006@ashrae.net
President-Elect	Elizabeth Jedrlinic	c006pe@ashrae.net
Vice President	Michael Razzano	c006vp@ashrae.net
Treasurer	Matthew Catan	c006tr@ashrae.net
Secretary	Zhigang XU	c006sec@ashrae.net
Board of Governors	Richard Smith	c006bog1@ashrae.net
Board of Governors	Michael S. Gerazounis	c006bog2@ashrae.net
Board of Governors	Thomas DiBenedetto	c006bog3@ashrae.net
Board of Governors	Matthew J. Vitrano	c006bog4@ashrae.net
Board of Governors	Murat Bayramoglu	c006bog5@ashrae.net

ASHRAE 2023/2024

COMMITTEES

COMMITTEE	NAME	EMAIL
Programs & Special Events	Michael Nigro	c006pe@ashrae.net
Membership (MP)	Murat Bayramoglu	c006mep@ashrae.net
Refrigeration	Matthew J. Vitrano	c006ref@ashrae.net
Chapter Technology Transfer (CTTC)	Thomas DiBenedetto	c006cttc@ashrae.net
Government Activities (GGAC)	Rich Smith	006ggac@ashrae.net
Newsletter Editor	Alexis H. Smith	c006ne@ashrae.net
Research Promotion (RP)	Peter Conte	c006rp@ashrae.net
Historian	Thomas DiBenedetto	c006his@ashrae.net
Student Activities (SA)	Zhigang Xu	c006sa@ashrae.net
Young Engineers in ASHRAE (YEA)	Steven Gerazounis	c006yea@ashrae.net
Webmaster	Frank Paradiso	c006web@ashrae.net
Nominating	Michael Gerazounis, PE, LEED AP	nominating@ashraeli.org
Reception & Attendance	Zhigang Xu / Matt Catan / Michael S. Gerazuonis	reception@ashraeli.org
PR & Engineering Joint Council of LI (EJCLI) Liaison	Andrew Manos, LEED AP	pr@ashraeli.org
Golf Outing	Peter Gerazounis, PE LEED AP	golf@ashraeli.org
Awards	Brian Simkins	c006ha@ashrae.net
ASHRAE LI, P.O. Box 79, Commack, NY 11725		

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Meeting Program



Dinner Presentation

What Could Possibly Be New with Fin Tube,
Convectors, Cabinet Heaters, and Fan Coils?

Attendees
Will Earn
1 PDH!

Presented by: John Knowles

Senior Vice President of Application Engineered Design for Wales-Darby, Inc.

DATE:	TUESDAY, FEBRUARY, 13TH 2024		
Time:	6:00 PM - Cocktails and Hors D'oeuvres 7:00 PM - Dinner Presentations 8:45 PM - Conclusion	Fee:	Members - \$50 pp Guests - \$70 pp Students - \$15 pp
Location:	WESTBURY MANOR (516) 333-7117 1100 Jericho Tpke., Westbury, NY 11590 Directions are posted at @ www.ashraeli.org		
Presentation:	All attendees will receive 1 PDH.		
About our Speaker:	John Knowles is the Senior Vice President of Application Engineered Design for Wales-Darby, Inc. A graduate of Union College with a BS in Mechanical Engineering, John also holds a LEED AP Certificate. His expertise is derived from years of hands-on application and continuing education into the forms and functions of the equipment and systems that make up his designs. He has been an educator for many years providing training to the engineering community in both group and individual settings. John is proficient in system sizing and design software as well as CAD programs. He believes in creating and maintaining a strong working relationship with the engineering community. John has worked at Wales-Darby for over 36 years.		

Long Island Chapter - Past Presidents

1958	H. Campbell, Jr. PE	1990	Robert Rabell
1959	Clyde Alston, PE	1991	Gerald Berman
1960	Sidney Walzer, PE	1992	Donald Stahl
1961	Sidney Gayle	1993	Ronald Kilcarr
1962	William Kane	1994	Jerald Griliches
1963	Louis Bloom	1995	Walter Stark
1964	Milton Maxwell	1996	Joe Marino
1965	Will Reichenback	1997	Norm Maxwell, PE
1966	Joseph Minton, PE	1998	Alan Goerke, PE
1967	Irwin Miller	1999	Frank Morgigno
1968	Walter Gilroy	2000	Michael Gerazounis, PE, LEED AP
1969	Charles Henry	2001	Ray Schmitt
1970	William Wright	2002	Steven M. Stein, PE
1971	Louis Lenz	2003	Andrew Braum, PE
1972	Ronald Levine	2004	Claudio Darras, P.E.
1973	Henry Schulman	2005	Craig D. Marshall, P.E.
1974	Myron Goldberg	2006	John Nally
1975	John N. Haarhaus	2007	Peter Gerazounis, PE, LEED AP
1976	Richard K. Ennis	2008	Steven Friedman, PE, HFDP, LEED AP
1977	Kenneth A. Graff	2009	Steven Giammona, P.E., LEED AP
1978	Evans Lizardos, PE, LEED AP	2010	Nancy Román
1979	Albert Edelstein	2011	Carolyn Arote
1980	Ralph Butler	2012	Brian Simkins, LEED AP
1981	Robert Rose, PE	2013	Andrew Manos, LEED AP BD+C
1982	Timothy Murphy, PE	2014	Richard L. Rosner, P.E.
1983	Leon Taub, PE	2015	Thomas J. Fields, P.E., LEED AP
1984	Raymond Combs	2016	Donald Kane, P.E.
1985	Edward W. Hoffmann	2017	Andrew Dubel, P.E., LEED AP
1986	Jerome T. Norris, PE	2018	Richard Halley
1987	Abe Rubenstein, PE	2019	Frank Paradiso
1988	Michael O'Rourke	2020	James Hanna
1989	Mel Deimel	2021	Matthew J. Vitrano
		2022	Murat Bayramoglu

PAOE

What is ASHRAE PAOE?

The ASHRAE Presidential Award of Excellence (PAOE) is a society-wide point system to track and reward chapter achievements.

Each year, the Society President establishes the point-earning activities. In this way, chapters are mobilized to work toward common Society goals. Chapters enter points they earn in our online system, and earn awards at the Region and Society level for their achievements and commitment to excellence.

PAOE POINTS FOR 2022/2023

Chapter Members	Chapter Operations	CTTC	Communi-cations	GGAC	History	Member-ship	Research Promotion	Student Activities	YEA	Chapter PAOE Totals

FROM: Farooq Mehboob SUBJECT: PRESIDENTIAL AWARD OF EXCELLENCE (PAOE)

I am writing to you on 'Securing our Future,' a subject near and dear to us for ourselves, our families, and our beloved Society ASHRAE. This is our theme for this society year. We stand today on the threshold of the new era with its challenges, climate, economic and cultural changes to name a few. Yet we have new opportunities which await us in this digital age by global collaboration using the power of our relationships, knowledge and a willingness to change. To secure our future, every one of us needs to participate passionately in a transparent ASHRAE. The bedrock on which we will build our secure future is Diversity, Equity and Inclusion. Only then will we be able to harness the power of our relationships, harvest information in the service of our members, and embrace changes by breaking down silos and overcoming resistance to change. The PAOE system was created to provide guidance to Chapter leaders in planning your chapter activities. The goal of the 2021-2022 PAOE system was to offer a roadmap for successful Chapter operation. This year's PAOE program is designed to move our Society forward as I have explained and help in securing our future.

Historian



“No matter who we are or where we come from, we're all entitled to the basic human rights of clean air to breathe, clean water to drink, and healthy land to call home.”

- Martin Luther King, Jr.

Air filters are an integral part of building HVAC systems both literally and figuratively. Air filters remove particulate matter and contaminants from the air before it is circulated into a building. Air filters play a crucial role in maintaining indoor air quality by capturing dust, pollen, mold spores, bacteria, and other airborne particles. They help to create a cleaner and healthier environment by preventing these contaminants from being circulated through the HVAC system. In the age of COVID, HEPA filters help prevent the spread of viral particles.

Air Health supplied an interesting history of the HEPA filter in the Air + Health blog in 2022. It's well worth the read!

Thomas DiBenedetto, PE; Historian

The History of Air Purifiers and HEPA Filtration

For decades, HEPA filters have been the leading solution for filtering dust, pollen, viruses, germs and much more from the surrounding air. The story of the HEPA filter — which stands for “high-efficiency particulate air” filter — is just as fascinating as how they work. While air purifier history dates back to 1848, when Lewis P. Haslett patented a device using moist wool and a one-way clapper valve, the HEPA filter marked a huge leap forward in purification technology.

Before they were improving air quality for homeowners and office workers, HEPA filters were protecting U.S. soldiers on the World War II battlefield. Here's the full story and how it led to a filter that's still an industry leader well into the 21st century.

The Creation of the HEPA Filter

Before it was part of domestic filtration systems such as the Air Health Skye Portable Air Purifier, HEPA was a top-secret government project. HEPA filter history begins with a piece of paper the British found in a German gas mask early in WWI. They discovered the paper was exceptionally good at capturing chemical smoke. After duplicating it for their own gas masks, the British Army Chemical Corps also incorporated the idea into the “absolute air filter,” a mechanical blower that could purify air at operational headquarters.



Flash forward to 1942. The U.S. was starting the Manhattan Project in Oak Ridge, Tennessee, which led to the first nuclear bomb. They knew they needed a way to protect the nearly 90,000 Manhattan Project workers. Using the British gas mask and absolute filter projects as the groundwork, the U.S. Army Chemical Corps and National Defense Research Committee commissioned a joint project to develop a filter that could remove hazardous radioactive particles from the air.

Working with Nobel Laureate Irving Langmuir, they identified 0.3-micron diameter particles to be the most concerning and focused testing efforts on filtering this particle size. The result was the first HEPA filter, though they weren't officially known as such until the 1960s. Ultimately, these filters weren't effective at reducing the impact of radiation — but they offered excellent protection against chlorine gas, mustard gas and flamethrowers. As such, they were used both at Manhattan Project headquarters and in U.S. soldier gas masks for the remainder of the war.

PRESIDENT'S PAGE

The real meaning of ASHRAE



CECIL BOLING

Frankly, I am not greatly impressed by numbers. One hundred million people can be as wrong as they could be right or vice versa. If numbers alone counted India and China would be of greater significance in the world of today than is our own country.

ASHRAE is far more than the nearly twenty thousand people engaged in a more or less common activity using closely related engineering principles for the consummation of their individual goals.

First, ASHRAE is opportunity — to improve upon things as they are, to broaden the horizons of accomplishment and to insure more efficient and economical use of materials, energies, resources and efforts.

Second, it is figuratively a larger and more easily opened door for the man who has chosen engineering as a career and heating, refrigerating and air conditioning or ventilating as his field for activity.

Third, it is a challenge that we make the most of the inherent possibilities created by this now more broadly enveloping professional society.

Perhaps that sounds rather idealistic; you might have hoped that I would spell out in terms of specific things that would be personally rewarding to you. I do not think that to be the way that a professional society should function nor the way that an engineer should approach his membership in such an organization.

It requires no great study to realize that over the longer interval we must give in order to get and that, in the final sense, the more we give the more we get.

So let us approach the future of ASHRAE with the idea of how much we shall contribute as individuals to the possible progress of our Society, of our companies, of our associates and of ourselves.

Many of us know of the long hours put into the development of Standards, the furthering of the work of committees, the preparation of meetings papers and other lesser chores which may seem to go unrewarded and little noted. I do not think that they are ever purposeless or lacking in true effectiveness. The question is did we give enough to make the activities worthwhile?

As the first president of the American Society of Heating, Refrigerating and Air Conditioning Engineers, I feel that my part presently is to expedite organizational phases of the new Society for the sooner we establish ASHRAE as an operating entity the sooner we may proceed to those broader accomplishments which I envision for 1959 and later years. Other days will present other problems but if we have built well the future will be all that you and I have hoped in even our most optimistic moments.

Research Promotion



“If we knew what we’re doing it wouldn’t be called research”

– Albert Einstein

I would like to thank the companies who have participated in the annual Product Directory of Manufacturers and their Representatives. The product Directory has been prepared as a service to all its members and as a service to the local HVAC industry. It will be made available to all ASHRAE and non-ASHRAE members at no-cost and can be obtained from our monthly meetings or directly from our website.

This year’s overall research promotion goal is \$2,575,000 with many research projects on board. Our chapter is expected to raise \$29,025.00 towards the overall goal. I am hoping that I can count on the continued support of all our past contributors who have generously supported us over the years. I also look forward to gaining the support of new contributors this coming year. Last year we were successful in beating our goal and am hopeful that this year we can continuously raise the bar.

Thank you to our contributors!

Individuals

Mr. John D. Nally Mr. Matthew K. Catan

Mr. Peter J. Conte, PE

Ms. Elizabeth Jedrlinic

Mr. Andrew E. Manos

Mr. Michael Nigro

Mr. Murat Bayramoglu

Mr. Michael Steven Gerazounis

Mr. Richard W. Smith

Mr. Thomas Arthur DiBenedetto

Mr. Zhigang Xu

Mr. Albert Stark

Mr. Steven Gerazounis

Mr. Frank Paradiso

Mr. Michael H. Razzano

Contributions can be made in the following ways:

1. Mail checks, made out to ASHRAE Research Promotion to:

Peter Conte

ASHRAE Research Promotion Chair

PO BOX 79

Commack, NY 11725

2. Hand check to me at any of the chapter meetings.

3. PayPal from the ASHRAE Long Island Website

Click Donate Button

4. www.ashrae.org

Please make sure you accredit the contribution to the Long Island Chapter 006



- Pete Conte

Chairperson

YEA



Hello everyone, I am your YEA chair, Steven Gerazounis. The purpose of the YEA committee is to provide ASHRAE members 35 years old or younger with opportunities to network, educate and grow themselves through chapter events. Please check back regularly to the newsletter and on ASHRAE's website for all the news and opportunities available. I look forward to seeing as many of you as possible in the upcoming months at ASHRAE and YEA events!

The YEA group is hosting a tour of PJ Mechanical's Delta Sheet Metal Shop factory on February 21st. This will be a great opportunity for engineers who want to learn about the entire sheet metal process, from creating shop drawings to fabricating ductwork. Food and beverages will be provided. Use the link below to register.

<https://www.ashraeli.com/young-engineers-events.html>

ASHRAE LI CHAPTER'S ANNUAL FIELD TRIP



PJ MECHANICAL'S DELTA SHEET METAL SHOP



**\$30
Per
Person**

Date: Wednesday February 21st, 2024

Time: 6:00 – 8:00PM

Where: Delta Sheet Metal

940 S Oyster Bay Rd, Bethpage, NY 11714

*** Food and Beverages will be provided ***

YEA Events



YEA Leadership Weekend
1.0

LEARN MORE



YEA Leadership Weekend
2.0

LEARN MORE



YEA Leadership
International

LEARN MORE

YEA Programs



Leadership U

LEARN MORE



LeaDRS

LEARN MORE



HVAC Design Scholarship

LEARN MORE

<https://www.ashrae.org/communities/young-engineers-in-ashrae-yea/yea-events-and-programs>

Leadership Weekend 1.0

YEA Leadership Weekend (YLW) is back on March 22nd – 24th in Mexico City! This event is for young professionals who are looking to improve in the areas of leadership, networking, communication, and professional development. YLW is led by Ralph Kison as he guides individuals through a self-discovery process that reveals their strengths, talents, gifts, and passion. In addition, there will be an optional technical tour of the Tower Reforma on March 21st. Please use the link below to register, and hurry if you are interested as registration closes on February 1st!

<https://www.ashrae.org/communities/young-engineers-in-ashrae-yea/yea-events-and-programs/yea-leadership-weekend>

Leadership Weekend 2.0

YEA Leadership Weekend 2.0 (YLW 2.0) is designed to provide additional, more advanced resources to YLW alumni. For this continuation of YLW, Ralph Kison is back to facilitate and expand on the skills he taught at the existing YLW event. As YLW alumni, you've had the opportunity to use the resources and connections you gained at YLW to not only grow your professional careers, but develop your participation within ASHRAE. The purpose of YLW 2.0 is to continue that growth and development, and hopefully inspire even further leadership skills and aspirations! YLW 2.0 will take place May 3rd - 5th in Park City, Utah. Registration opens on January 15th.

<https://www.ashrae.org/communities/young-engineers-in-ashrae-yea/yea-events-and-programs/yea-leadership-weekend-2-0>

Leadership U

If you wanted the opportunity to participate and follow regional and society officers there are two great options to do so! With Leadership U (4) YEA members will be selected for the winter or annual conference and attend all of their respective society officer's events, board meetings and social activities. Applications for the 2024 Winter Conference in Chicago are open until October 15th. Please use the link below to register and for more information.

<https://www.ashrae.org/communities/young-engineers-in-ashrae-yea/yea-events-and-programs/leadership-u>

LeaDRS

Similar to the Leadership U program, LeaDRS allows a region to select any ASHRAE member to shadow their Director and Regional Chair (DRC) at an ASHRAE Conference. To apply for this program you must contact the DRC directly. For Long Island that would be Steven Sill.

Region I : Mr. Steven C Sill

Email: R01drc@ashrae.net

HVAC Design Scholarship

Are you looking for the chance to get a better grasp of the fundamentals and technical aspects to design, install and maintain HVAC systems? YEA has a fantastic program to cover all of those bases with an attendance scholarship for either level I or II training. Applications for this program are now open!

<https://www.ashrae.org/communities/young-engineers-in-ashrae-yea/yea-events-and-programs/yea-scholarship-for-hvac-design-essentials-training>

Technical Committees

Are you looking to get more involved with your industry or ASHRAE as a whole? Take a look to see if there are any technical committees that interest you!

<https://ashrae.org/technical-resources/technical-committees>

Getting more involved gives you the opportunity to directly impact our industry and expand your knowledge base. To learn more about these committees you can also reach out via phone or email at:

404-636-8400

tcstaff@ashrae.net

YEA Awards

So many YEA members are deserving of awards for their hard work, dedication and faithful service to this society but don't receive them because people don't know they are eligible to be nominated. Please look into the numerous awards available for YEA members under the Honors and Awards tab.

<https://www.ashrae.org/communities/young-engineers-in-ashrae-yea/honors-and-awards>

For any awards that you cannot nominate yourself or another YEA member you may need to reach out to your YEA Regional Vice Chair, Society YEA Committee member or Director and Regional Chair to provide them with the information they require to submit a nomination form.

Please feel free to reach out to me with any questions or comments about YEA.

- Steven Gerazounis



Government Affairs Committee (GAC)

New Year Brings New Enforcements.

Welcome to 2024 where the Fines begin to Chime. It was the Great George Orwell that maybe summed up our current dilemma best when he said. ***“If liberty means anything at all, it means the right to tell people what they do not want to hear.”***

We have finally approached a point where the Rubber has Hit the Road. The electrification has truly begun, and we can only hope it all works out. After all we as Engineers have no way of estimating or surmising whether we are correct in our assumption or not! The City and State say it's OK and I'm sure we can trust their Experience or Fortune Tellers or Prophets.....

Wait!!... We have resources to predict future supply of the electric grid.

A Report was just published Nov 23, 2023 from the New York Independent System Operator (aka NY ISO)

The 2023-2032 Comprehensive Reliability Plan.

A few Items stood out to me that I would like to share.

Risk Factors – Increasing Uncertainty Driven by Pace of Change

The CRP's finding of no long-term reliability violations reflects the Reliability Planning Process assumptions, which are set in accordance with applicable reliability design criteria and NYISO's procedures. There are, however, risk factors that could adversely affect system reliability over the planning horizon. These risk factors may arise for several reasons including climate, economic, regulatory, and policy drivers.

The pace of generator retirements exceeding the pace of resource additions poses a significant risk to grid reliability. Since the enactment of the Climate Leadership and Community Protection Act (CLCPA), more than twice the capacity of generation has deactivated than has been added to the system. Should this trend continue, additional reliability needs may be identified, both statewide and for localities. The specific attributes of the generator retirements and resource additions also can impact system reliability. The effect of phasing out of the New York Power Authority's (NYPA) small natural gas plants by December 31, 2030, as directed by recent legislation, is of particular concern because of the potential impact on already thin transmission security margins in New York City. The NYISO's preliminary assessment of the 2030 phase-out of NYPA's small natural gas plants totaling 517 MW shows that the New York City transmission security margin would be deficient as early as 2031, without additional resources to take their place or delays in their retirement. The deficiency worsens to over 600 MW by 2033 when considering the higher range of the forecast and would be far worse without the CHPE project in service. The NYPA small plant phase-out will be further evaluated in the *2024 Reliability Needs Assessment*.

New York City Deficiency Resulting from NYPA Small Plant Phase-Out without Replacement (MW)

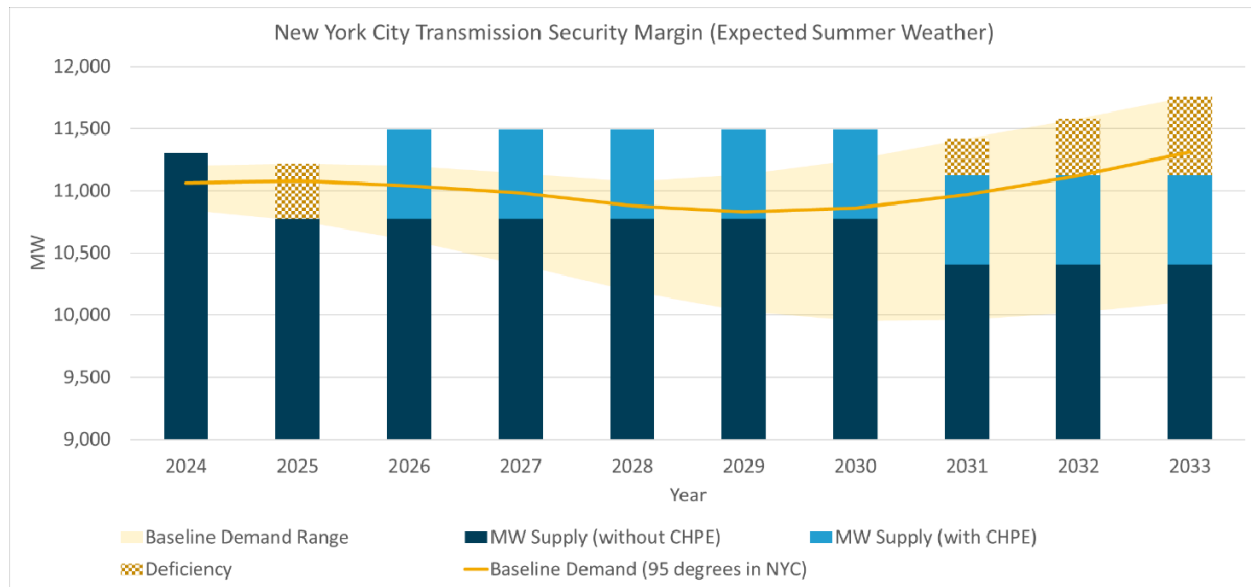
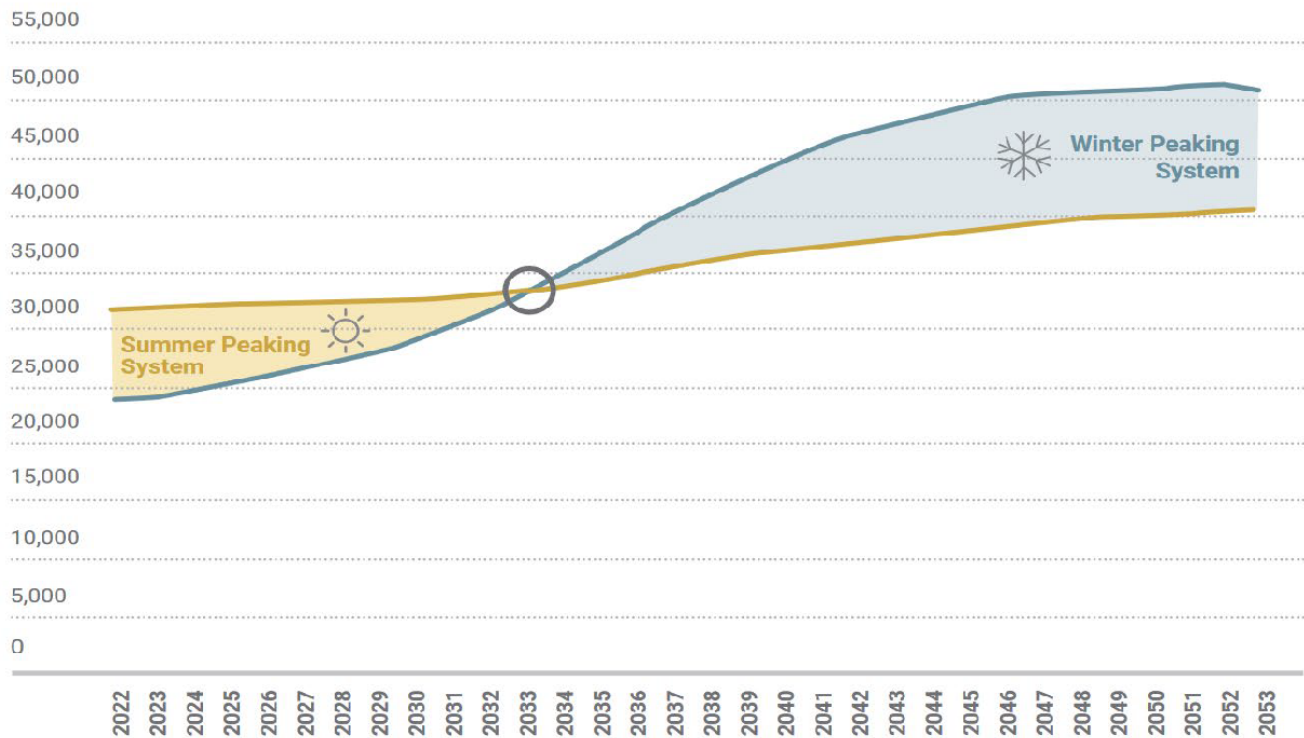
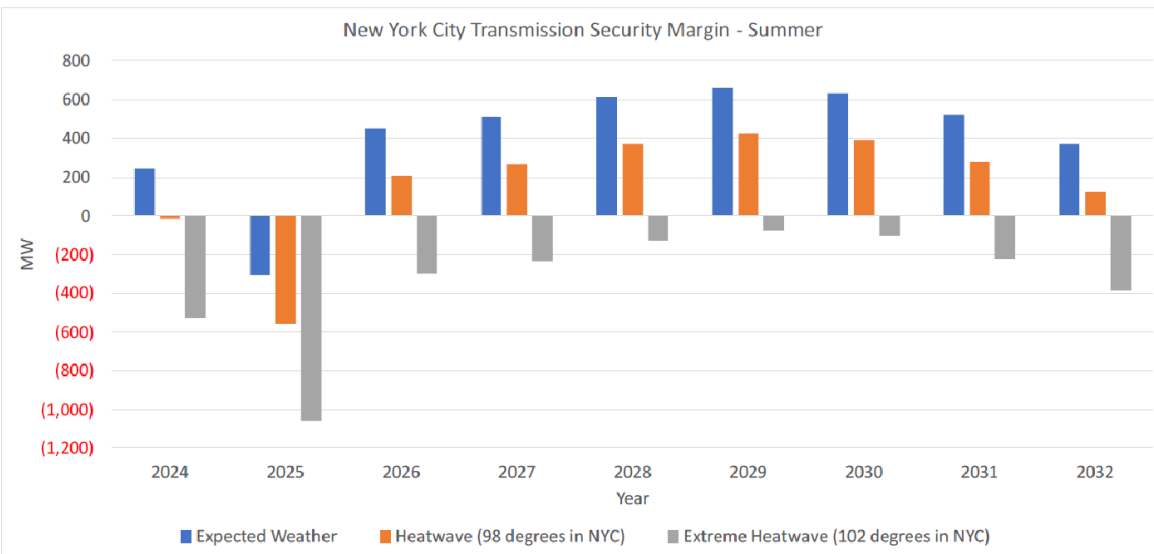


Figure 30: Summer and Winter Peak Demand Forecasts (MW)



Preliminary results of the 2023 Fuel and Energy Security study demonstrate that NYISO will need to rely significantly on dual-fuel generation resources to support winter system reliability into the next decade and changes to the resource mix may complicate system operations during multi-day cold snap conditions. The frequency and severity of projected potential loss of load events grow over the modeling time horizon as the generation mix evolves and the demand for electricity increases. In 2023/2024 fuel supply disruptions are the most prominent concern. In the 2026/2027 winter, lulls in intermittent resource generation resources, particularly offshore wind, also become prominent. Finally, in 2030/2031, the results portend a growing frequency in operational challenges and loss of load events across all assumed disruptions. It remains clear that, the availability of oil and gas remains critical during these modeling periods. The New York City winter transmission security margin under a cold snap is sufficient for all years; however, an extreme cold snap would result in a deficiency of 88 MW in winter 2032-33.

Figure 35: New York City Summer Transmission Security Margin with Extreme Weather



This study was done with some considerations to LL154 but not implemented until 2032. It begs the question that if the assumption of Gas being used until then is baked into the numbers, then we could be substantial off on the projections Especially in winter.

For a simplified discussion of this report, you can find it at the link below.

<https://www.nyiso.com/documents/20142/41557188/CRP-Report-Outlines-Risks-to-Grid-Reliability.pdf/2c0f474c-3c6a-fe58-32ab-5fdc68fbaa09>

Full Report

<https://www.nyiso.com/documents/20142/2248481/2023-2032-Comprehensive-Reliability-Plan.pdf/c62634b6-cdad-31dc-5238-ee7d5eaece04>

Richard Smith – GAC Chair.

Matt Catan – Co-Chair

006ggac@ashrae.net

Refrigeration



The Refrigeration Committee is back! Check out the EPA approval on new non-flammable substitutes including R-471A & R-515B refrigerants. The article can be found via accessing the below link:

<https://www.achrnews.com/articles/153632-epa-approves-new-refrigerants-for-refrigeration>

As part of its Significant New Alternatives Policy (SNAP) program, the [Environmental Protection Agency \(EPA\)](#) recently issued a determination of acceptability ([Notice 38](#)), which expands the list of acceptable refrigerant substitutes for the refrigeration market. The new substitutes include the nonflammable refrigerants, R-471A and R-515B.

EPA found R-471A (marketed under the trade name Solstice® 471A) acceptable as a substitute for use in:

- Retail food refrigeration—stand-alone equipment (new equipment only);
- Retail food refrigeration—refrigerated food processing and dispensing equipment (new equipment only);
- Retail food refrigeration—remote condensing units (new equipment only);
- Retail food refrigeration—supermarket systems (new equipment only);
- Industrial process refrigeration (new equipment only); and
- Cold storage warehouses (new equipment only).

R-471A, which is classified as an A1 refrigerant, has a GWP of about 144 and an ODP of zero. According to Honeywell, Solstice 471A is 13% more energy efficient as compared to R-404A and 30% more energy efficient compared with CO₂.

- In addition, EPA found R-515B acceptable as a substitute for use in:
- Retail food refrigeration—refrigerated food processing and dispensing equipment (new equipment only);
- Retail food refrigeration—remote condensing units (new equipment only);
- Retail food refrigeration—supermarket systems (new equipment only);
- Commercial ice machines (new equipment only); and
- Cold storage warehouses (new equipment only).

R-515B is also classified as an A1 refrigerant and has a GWP of about 287 and an ODP of zero. For remote condensing units and supermarket systems, EPA states that R-515B's GWP is comparable to or lower than that of other acceptable substitutes for new equipment, such as R-450A (GWP of 601), R-513A (GWP of 630), R-407A (GWP of 2,110), and R-421A (GWP of 2,630).

For additional information on SNAP, visit the SNAP portion of EPA's Ozone Layer Protection website at: www.epa.gov/snap.

Michael H. Razzano
Refrigeration Chair

Kenny Balci
Refrigeration Co-Chair

MEMBERSHIP PROMOTION



The role of the Membership Promotion Committee is to maintain the chapter’s membership growth each year and upgrade membership promotions. Our committee members understand that the membership is the core of our organization and put their volunteer efforts into growing the membership. At the beginning of this season, the Long Island chapter had 272 active members, excluding student members. As of Feb 7, we have 272 active members and 20 student grade members. This year, we want to reach 280. We only need to add eight more new members by the end of June 2024. We can easily surpass this goal with the contribution of our volunteers. We will promote activities to increase our membership, such as YEA and student activities, panels in Decarb/sustainability topics, and monthly technical presentations. We plan a showcase at Westbury Manor jointly with ASPE

in the spring, a golf outing in May, and a fishing boat trip in June. Anyone who is interested in becoming an ASHRAE member can find me or one of our committee members, Liz, Albert, Steve, or Matt. Follow our activities through this newsletter and LinkedIn.

Start Total	Goal	Net Growth Goal	Net Growth Goal %
272	8	280	2%

Here’s the good news. New members can sign up for either Winter or Summer conference for free. I encourage our new members to contact me if they want to sign up for a conference. Students only pay \$25 per year. The Smart Start program is still active. So many different options are available at ashrae.org. Below is the summary of membership benefits.

We have 29 new members since the beginning of this season. However, 29 new members were not enough to increase our membership. This means that, during this period, we lost 29 members. As a chapter, we are having difficulties retaining membership. We must work more to increase the number of new members to maintain net positive growth because people are moving, changing jobs, or canceling their membership due to personal reasons. If any current active members have friends interested in joining ASHRAE, please invite them to our monthly meetings. If any of our active members bring a new member, both of their dinners are on us.

Lastly, I want to welcome our new members. I encourage them to attend monthly meetings to engage with Long Island’s industry professionals and learn from 1 PDH credited presentations. Our meetings at this great venue, Westbury Manor, allow guests to engage with free drinks during happy hour socially. Hope to see you all there.



Adrian Jhansci Diaz Gomez
Glen P. Bornhoft
Anthony Ottaviano
Joseph William Burke
Denny Vayalickollattu Johney
Peter Sgouros
Ethan Peck
Troy Peter Deal
Matthew Steven Burke
Thomas Kenny
Matthew R. Gropper
Zachary Chirinkin
Lance Montalbano Jr.
Kavya Srinidhi Cherolu
Christopher G. Cawley
Ryan Burwell
Laura Heckman
Thomas Naggy
Murat Ertas
Ralph Byers
Christopher R. Mangels
Dimitri Grammatikopolous
Thomas Nagy
Tiffany Gonzales
Michael Yurman
Arthur J Seeberger
Drew Lawrance Maggio
Julian Czerewin
Seth Blumencranz

Again, I want to welcome and personally invite our new members to our meetings. I encourage our new members to join our committees to volunteer in activities. Volunteering is an excellent path for especially young engineers to steer their careers as they collaborate with various industry professionals.

Membership Promotion Chair
Murat Bayramoglu

Sustainability Committee



The sustainability committee of the ASHRAE Long Island Chapter is looking forward to promoting insightful and educational events, meetings and seminars with the broad goal of promoting members to share their engineering knowledge and improve the world around them.

In the US, building emissions are estimated to contribute 777.53 million metric tons of CO₂ equivalent, escalating the rate of climate change on our planet^[1]. In order to mitigate this footprint, legislation has been passed at both the local level^{[2][3]} and at a federal level^[4] to incentivize green energy initiatives and discourage local building emissions.

Building decarbonization is an extremely popular topic in 2023, and I believe nearly all my fellow ASHRAE colleagues have been, and will continue to be affected professionally by this relatively new page in HVACR...

Albert Stark
ASHRAE LI Sustainability Chair

[1]. <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions#commercial-and-residential>

[2]. <https://www1.nyc.gov/site/sustainablebuildings/ll97/local-law-97.page>

[3]. https://www1.nyc.gov/assets/buildings/local_laws/ll154of2021.pdf

[4]. <https://www.congress.gov/bill/117th-congress/house-bill/5376>

Student Activities



The deadline to submit entries for the 2024 ASHRAE HVAC&R Student Paper Competition has been extended to December 18th, 2023. Finalists will present virtually (online) January 8th 2024.

Here's an opportunity to have your research recognized and compete against fellow ASHRAE Student Members.

Papers are being accepted on the following topics:

- HVAC&R technology
- Building services
- Indoor environmental control
- Energy performance of buildings

This competition is open to students and graduates who have completed their bachelor's or master's thesis in 2023. The paper must be based on an accepted thesis. Submissions based on doctoral thesis are not eligible.

The first-place winner will represent ASHRAE at the 2024 World Student Competition, held in Pyeong Chang, Korea during the SAREK Summer Annual Conference, June 19-21, 2024. Travel expenses, hotel and conference registration will be paid by ASHRAE to attend the World competition.

Upcoming Timeline:

December 18th, 2023 – Entrants submit a six-page maximum length paper that is based on an accepted BS or MS thesis. The finalists will be selected, advised, and invited to the next stage.

January 4th, 2024 – Posters are due. The content of the A1-size poster may be used as the basis of a visual presentation to accompany the oral presentation.

January 8th, 2024 – The finalists give a 10-minute virtual presentation.

January 21st, 2024 – Winning papers are announced and presented during the Student Program.

More information about the competition and requirements are available at:

<https://www.ashrae.org/communities/student-zone/competitions/hvac-r-student-paper-competition>

Of course, there are even much more. Explore ASHRAE Student Zone:



<https://www.ashrae.org/communities/student-zone>

Please reach out for more information if you are interested in participating any of the above programs. If you have any suggestions or would like to assist in anyway with student activities, please let me know. I look forward to seeing a lot of young faces for ASHRAE Long Island!

Zhigang Xu

Student Activities Chair

Diversity & Inclusion



Overview

Happy New Year! We hope that everyone had a nice holiday and a great New Years filled with lots of family, fun, and no work emails!

ASHRAE is committed to providing a welcoming environment. Our culture is one of inclusiveness, acknowledging the inherent value and dignity of everyone. We proactively pursue and celebrate diverse and inclusive communities understanding that doing so fuels better, more creative, and more thoughtful ideas, solutions and strategies for the Society and the communities our Society serves. We respect and welcome all people regardless of age, gender, ethnicity, physical appearance, thought styles, religion, nationality, socioeconomic status, belief systems, sexual orientation or education.

ASHRAE Training Recordings: DEI Foundations & Implicit Bias in Decision-Making

Video Topics include Microaggressions, Equality vs Equity, Cultural Competency, Understanding Implicit Bias in Decision-Making, DEI Foundations

Video Link: <https://presentationaccess.ashrae.org/Index?identity=memberchair>

DEI Suggested Readings:

Blind Spot: Hidden Biases of Good People – Mahzarin R.R. Banaji and Anthony Greenwald

- Thinking Fast Slow - Daniel Kahneman
- The 4 Stages of Psychological Safety: Defining the Path to Inclusion and Innovation – Timothy R. Clark
- The Sum of Us: What Racism Costs Everyone and How We Can Prosper Together - Heather McGhee
- So You Want to Talk About Race – Ijeoma Oluo
- Inclusive Conversations – Mary-Frances Winters
- The 5 Disciplines of Inclusive Leaders – Andres T. Tapia & Alina Polonskaia
- How to Manage Conflicts: 7 Easy Steps to Master Conflict Management, Conflict Resolution, Mediation & Difficult Conversations – Amy Gallo
- Radical Candor – Kim Scott
- Biased: Uncovering the Hidden Prejudice That Shapes What We See, Think and Do – Jennifer Eberhardt
- What Works: Gender Equality by Design – Iris Bohnet
- Disability Visibility: First Person Stories from the 21st Century – Alice Wong
- Men Explain Things to Me – Rebecca Solnit

Members of the ASHRAE Board of Directors Diversity, Equity and Inclusion Subcommittee:

- Kishor Khankari, *Chair*
- Cheng Wee Leong
- Devin Abellon, *Consultant*
- Susanna Hanson, *Vice Chair*
- Heather Schopplein
- Dunstan Macauley III, *Consultant*
- Mahroo Eftekhari
- Jonathan Smith
- Tanisha Meyers-Lisle, *Staff Liaison*

Why Is Diversity in Engineering Important?

It should go without saying that an engineer, no matter the specialty, can be any race, gender, religion, sexuality, or any other minority demographic. However, according to Zippa's accumulation of engineer demographics and statistics in the U.S., the demographics of engineers have hardly changed since 2010.

When employers commit to diversity in engineering, the company can reap many benefits, including a better reputation, higher profits, strong values, and more. Enhance your workforce by dedicating your recruiting efforts to searching for applicants whose backgrounds can contribute to improving the quality of work your company produces.

Why Is Diversity in Engineering Important?

Recruiting a diverse workforce is the best way to foster inclusion in the engineering industry. According to Zippa's research:

- Women make up only 13.7% of the engineering workforce, whereas men account for 86.3%.
- The average age of employed engineers is 40 years old.
- The majority ethnicity among engineers is White, making up 67.9% of the workforce. Asian engineers follow this at 15.0%, and Hispanic or Latino engineers at 9.1%.

With this in mind, there is a large need for employers to consider diversity and inclusion during hiring processes. Engineering is a field built on solving problems, and a diverse workforce allows different perspectives and backgrounds to come together and think critically about a problem.

4 Benefits of Diversity in Engineering

To increase diversity in your workforce, it is crucial to create opportunities for individuals who fall within underrepresented groups found in this job field. It is important to understand how hiring diverse engineers can contribute to your company's success and establish it as a highly regarded workplace.

1. Leads to More Innovation

Employers must understand that race, gender, or any other personal characterization does not limit success in the engineering field. When you hire a diverse team, you are opening your company to various ways of thinking and working, leading to innovation and a wide range of skills and methods.

To unlock the full spectrum of talent and to promote innovation in engineering, it is imperative to address these barriers head-on. By dismantling systemic obstacles and creating an inclusive environment, women and minorities can be provided with equal access to resources, education, and opportunities.

2. Increases Profits

Diversity in the workforce amplifies perspectives, fueling innovation, growth, and financial success. A study by the Peterson Institute found that companies with gender diversity in top leadership roles experienced significant increases in net profits. This survey also noted that companies that have a higher amount of women in their workforce lead to higher job satisfaction ratings for the staff.

Embracing diversity unlocks fresh insights, unique problem-solving approaches, and heightened creativity. Diverse teams excel in adaptability, opportunity identification, and navigating complexities.

Embracing diversity unlocks fresh insights, unique problem-solving approaches, and heightened creativity. Diverse teams excel in adaptability, opportunity identification, and navigating complexities.

3. Promotes Strong Values and Ethics

Diversifying the engineering field is not only ethically imperative but also a reflection of societal progress. As nations strive for equality, engineering must represent an inclusive society and treat qualified individuals fairly. Proactive measures such as diverse hiring practices and incentivizing STEM education can foster a broader pool of applicants.

Companies and educational institutions are vital in promoting diversity, equal opportunities, and shaping an inclusive engineering profession. Engineering recruiting firms play an essential role by advocating for diversity in hiring practices and connecting qualified candidates from underrepresented backgrounds with employment opportunities.

4. Matches Changing Demographics

The United States has established itself as a globally renowned powerhouse in engineering breakthroughs and innovations. However, to maintain this status, engineering companies must demonstrate their willingness to embrace diversity by hiring individuals of all races, genders, ages, sexualities, and creeds.

The 2011 United States Census reported that approximately 50.4 percent of newborns were non-white, indicating that future employees are likely to be from diverse racial and ethnic backgrounds. By proactively prioritizing diversity in their hiring practices, engineering companies can unlock the immense potential of a diverse workforce and ensure their sustained success in an ever-evolving and multicultural world.



How Can Your Company Encourage Diversity Among Engineers?

Are you committed to creating a diverse workforce at your engineering company but need help with expanding your reach? There are several steps your company can take to enhance the rate of diverse candidates you interview and hire without requiring extensive effort or training.

From using more inclusive and descriptive job descriptions to presenting yourself as a united front, there are easy ways to increase your likability to potential employees. Working with an engineering recruitment firm can help you reach out to a diverse group of qualified engineers to potentially employ.

Use Inclusive Language in Job Descriptions

If employers are not careful, the wording of a position's job description can turn off potential candidates. Using non-inclusive language may ward off those who are qualified for the job and would be highly valuable to your team. Because of this, when referring to race, gender, sexuality, or even location in the description, it is important to be inclusive and general with your terms.

By not targeting a specific demographic and using inclusive language, you open yourself to an abundance of candidates that may be exactly what you're looking for. Are you having trouble with the wording of your job postings? Work with professional recruiters to help you craft the perfect job description.

Hire for Skills

No matter the job, it should be obvious to employers to hire people with the necessary skills for the job, not on who they are. When hiring an engineer, it is essential to prioritize skills and qualifications over biases. Focusing solely on an individual's abilities, expertise, and experience allows for a fair evaluation process and ensures that the most capable candidates are selected. By doing this, you open yourself up to a wider pool, leading to innovation and success.

Create a Diverse Interviewing Team

An effective approach to putting your candidates at ease is to establish a diverse hiring team to conduct interviews. From childhood, encountering individuals who resemble and reflect our own identities in the workplace has always been comforting and motivating. Demonstrating a united front shows that you are dedicated to recognizing and appreciating individuals for their skills and abilities rather than solely considering their demographic information.

When you are hiring for engineering jobs in Kansas City and need assistance in growing your reach to underrepresented groups of people, work with our professional recruiters at Austin Nichols Technical Search. Our team is dedicated to helping you find the right person for the right job. Contact us today and tell us how we can improve your recruiting and diversity efforts.

Written by Evan McDowell

Talent Acquisition Manager

Long Island Science & Engineering Fair, Inc.

998 Old Country RD STE C PMB 164
Plainview, New York 11803 www.lisef.org

Angela Lukaszewski, President
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Dr. Joyce Hilgeman, Trustee
Dr. Michael Lake, Trustee
Dr. David Ralston, Trustee
Brian Snyder, Trustee

Dear Colleague,

LISEF is going live again!

The Long Island Science and Engineering Fair (LISEF) is among the largest regional high school fairs in the country. At this yearly forum outstanding students submit and exhibit their research. Based on judges scores, finalists are selected from over 500 student participants to compete at the annual International Science and Engineering Fair (ISEF).

This year, LISEF 2024 will be a two-round in-person event. Round 1 (Wednesday, January 31st) and Round 2 (Tuesday, March 5th) will be held at the Crest Hollow Country Club in Woodbury, NY. We will be following all local, NYS DOH, and CDC Covid-19 guidelines. Changes to the events may be made, if needed, to meet health and safety requirements.

Inevitably, we find ourselves **in need of qualified judges** each year to help evaluate student projects in 22 disciplines. Judges are typically asked to interview, evaluate, and score between 8- 12 projects, depending on the category. We are asking all qualified individuals (medical/veterinary doctors, university faculty, post-doctoral associates, graduate students, engineers with field experience) to consider judging at **either** or **both** Rounds of our fair. Judges are asked to sign-in by 8 AM both days and can expect to leave by 3:00 PM on January 31st and 1:30 PM on March 5th. All judges are provided a continental breakfast and a buffet lunch.

This year judges' registration will remain open through January 30th and reopen February 1st. Project abstracts will be available for review January 25th.

A recommended scoring rubric will be available to use as a guide for judges. Winners will be selected by converting the judges raw scores from both rounds into Z-scores.

The LISEF judging categories are listed at the end of this letter.

If you judged for us last year, your information has been archived, you can login using your username and password from last year or view our [How To Restore Judges Information](#)". Edit all information as needed if there have been any changes in the past year.

If you are joining us as a judge for the first time, there are **three key steps** to the registration process:

Step 1. You will need to **create a user account** on the LISEF website (and only then can you complete the registration process) To “Create User Account” please view our [How To Guide to Create a New Judges Account.](#)”

- a. In the top right corner of the LISEF website (www.lisef.org), select “REGISTER”
- b. First and Last Name, email address, phone number and a password are required to create an account.
- c. Once an account is created it can be used every year moving forward.

Step 2. Verify Email (An email will be sent to you to verify the account.)

Step 3. Register as a LISEF Judge

- a. Once your account is verified, you can proceed via the emailed link, or click on “LOGIN” on the top right of the LISEF website.
- b. Select LISEF Judge and proceed from there.

Judges will be asked to provide the following information:

Academic Discipline; Degree; Current or Former Institutional Affiliation or Place of Employment; Indicate up to 3 category judging preferences; years judging at LISEF; recommendations for additional LISEF judges if any and their lunch choice.

Please note – Once judges have completed their registration they are then logged into their dashboard. From the dashboard judges can also edit parts of their registration, view the ISEF category descriptions, view project abstracts after January 24th.

Thank you in advance for registering as a judge or taking a moment to share this email with your colleagues as we are always in need of additional judges. We have personally found our involvement with LISEF to be a rewarding experience. We hope you will as well!

Sincerely,

Dr. Joyce Hilgeman
Trustee & Judges Co-Chair

Dr. Michael Lake
Trustee & Judges Co-Chair

ANIMAL SCIENCES (ANIM) Animal Behavior/ Cellular Studies/ Development/ Ecology/ Genetics/ Nutrition and Growth/ Physiology/ Systematics and Evolution/ Other

BEHAVIORAL AND SOCIAL SCIENCES (BEHA) Behavioral Neuroscience/ Developmental/ Cognitive Psychology/ Sociology and Anthropology/ Other

BIOCHEMISTRY (BCHM) Analytical Biochemistry/ General Biochemistry/ Medical Biochemistry/ Structural Biochemistry/ Other **BIOMEDICAL AND HEALTH SCIENCES (BMED)** Cell, Organ, and Systems/ Physiology/ Genetics and Molecular Biology of Disease/ Immunology/ Nutrition and Natural Products/ Pathophysiology/ Other

BIOMEDICAL ENGINEERING (ENBM) Biomaterials and Regenerative Medicine/ Biomechanics/ Biomedical Devices/ Biomedical Imaging/ Cell and Tissue Engineering/ Synthetic Biology/ Other

CELLULAR AND MOLECULAR BIOLOGY (CELL) Cell Physiology/ Cellular Immunology/ Genetics/ Molecular Biology/ Neurobiology/ Other

CHEMISTRY (CHEM) Analytical Chemistry/ Computational Chemistry/ Environmental Chemistry/ Inorganic Chemistry/ Materials Chemistry/ Organic Chemistry/ Physical Chemistry/ Other

COMPUTATIONAL BIOLOGY AND BIOINFORMATICS (CBIO) Computational Biomodeling/ Computational Epidemiology/ Computational Evolutionary Biology/ Computational Neuroscience/ Computational Pharmacology/ Genomics/ Other **EARTH AND ENVIRONMENTAL SCIENCES (EAEV)** Atmospheric Science/ Climate Science/ Environmental Effects on Ecosystems/ Geosciences/ Water Science/ Other

EMBEDDED SYSTEMS (EBED) Circuits/ Internet of Things/ Microcontrollers/ Networking and Data Communications/ Optics/ Sensors/ Signal Processing/ Other

ENERGY: SUSTAINABLE MATERIALS & DESIGN (EGSD) Biological Process and Design/ Energy Storage/ Hydrogen Generation and Storage/ Other Thermal Power/ Solar Process, Materials, and Design/ Thermal Generation and Design/ Triboelectricity and Electrolysis/ Wind/ Wind and Water Movement Power Generation/ Other

ENGINEERING TECHNOLOGY: STATISTICS AND DYNAMICS (ETSD) Aerospace and Aeronautical Engineering/ Civil Engineering/ Computational Mechanics/ Control Theory/ Ground Vehicle Systems/ Industrial Engineering-Processing/ Mechanical Engineering/ Naval Systems/ Other

ENVIRONMENTAL ENGINEERING (ENEV) Bioremediation/ Land Reclamation/ Pollution Control/ Recycling and Waste Management/ Water Resources Management/ Other

MATERIALS SCIENCE (MATS) Biomaterials/ Ceramic and Glasses/ Composite Materials/ Computation and Theory/ Electronic, Optical and Magnetic Materials/ Nanomaterials/ Polymers/ Other

MATHEMATICS (MATH) Analysis/ Combinatorics, Graph Theory, and Game Theory/ Geometry and Topology/ Number Theory/ Probability and Statistics/ Other

MICROBIOLOGY (MCRO) Antimicrobials and Antibiotics/ Applied Microbiology/ Bacteriology/ Environmental Microbiology/ Microbial Genetics/ Virology/ Other

PHYSICS AND ASTRONOMY (PHYS) Astronomy and Cosmology/ Atomic, Molecular, and Optical Physics/ Biological Physics/ Condensed Matter and Materials/ Mechanics/ Nuclear and Particle Physics/ Theoretical, Computational and Quantum Physics/ Other **PLANT SCIENCES (PLNT)** Agriculture and Agronomy/ Ecology/ Genetics/Breeding/ Growth and Development/ Pathology/ Plant Physiology/ Systematics and Evolution/ Other

ROBOTICS AND INTELLIGENT MACHINES (ROBO) Biomechanics/ Cognitive Systems/ Control Theory/ Machine Learning/ Robot Kinematics/ Other

SYSTEMS SOFTWARE (SOFT) Algorithms/ Cybersecurity/ Databases/ Human-Machine Interface/ Languages and Operating Systems/ Mobile Apps/ Online Learning/ Other

TECHNOLOGY ENHANCES THE ARTS (TECA) Display Technology/ Human Information Exchange/ Music and Image Manipulation/ Games/ 3D Modeling/ Engineering Effects/ Other

TRANSLATIONAL MEDICAL SCIENCES (TMED) Disease Detection and Diagnosis/ Disease Prevention/ Disease Treatment and Therapies/ Drug Identification and Testing/ Pre-Clinical Studies/ Other

ASHRAE CERTIFICATIONS

Certification



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- Are developed by industry practitioners who understand the knowledge and experience that are expected for superior building design and system operation
- Assure employers and clients of subject mastery
- Serve as a springboard for continued professional development
- Offer an easy-to-apply process

FOR MORE INFORMATION GO TO - <https://www.ashrae.org/education--certification/certification>

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Most Popular Tweets

Does It Cost More To Build Green? Benefits include reduced operating costs & construction waste.

Online Thermal Comfort Compliance Tool Included In New ASHRAE User's Manual.

87% of households in the US have #AC, 5% do in India. India's tough choice on air-conditioning and climate.



The November issue of the Journal is tested for binding strength to see how many times a page can be turned before the binding would fail.

Harvard & SUNY Upstate Medical University find that workers are healthier and happier in certified green buildings.

ASHRAE Standard 90.1 has been redefining energy savings since 1975. A new version is available now.

Adapting historical buildings for sustainable reuse.

Get To Know ASHRAE







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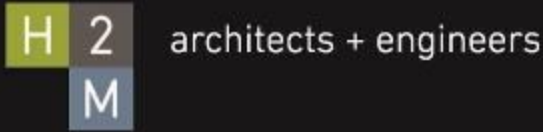


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