THE MAINTENANCE BEACCONN

The Monthly Newsletter of the North Carolina Public School Maintenance Association

Volume 59, Number 1 January 2022

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RETIREMENT ANNOUNCEMENT

NCPSMA Executive Director Retirement Announced

Roxie Thay Rupard Mack grew up in the lower part of Wilkes County to proud parents Marfice Pressley "M.P." and Lora Lunsford Rupard. She has two sisters (Nedra and Janet) and a brother (Mark). After graduating in 1978 from North Iredell High School she attended Mitchell Community College and Gardner Webb College. While at Gardner Webb she met the love of her life, Ron Mack and they were married on July 6, 1980. Ron started working in the maintenance world in Wilkes County Schools in 1981 before moving on to Elkin City Schools in 1986 as the Maintenance Director where he remained employed until his retirement in 2012. They have two children; a son, Rupard Mack; and a daughter, Rheannon Williamson and her husband Jason; and beautiful granddaughter Bethany. In her spare time, you can find her crafting, working in her "She-Shed" Ron built for her in her gardens of never-ending beauty that would amaze the greatest landscapers.

Before coming to the North Carolina Public School Maintenance Association (NCPSMA), Roxie worked on the beloved family farm growing up. She helped milk the dairy cows from time to time and she spent her summers working in tobacco. Roxie drove a school bus during her junior year of high school and worked in sales/record keeping in the automotive department of K-Mart in during her senior year. In 1986 she was hired as the Sales Secretary for Elkin Valley Apparel (EVA) and she also worked at Lennox Candle Company. She then moved on to Yadkin Valley Bank and Trust Company in Elkin where she served in bookkeeping, as a teller, in loan operations and as a customer service representative.

On April Fool's Day in 1993 NCPSMA made one of the best decisions this organization has ever made and Roxie Mack began her journey into the world of Public-School Maintenance.

After searching for a year to find just the right candidate, Executive Committee Chairman, Robert Smith made the announcement that the Executive Committee had chosen Roxie Mack to be the new NCPSMA Executive Secretary. This position would later lead into the role as Executive Director. Citing all the reasons they had chosen Mrs. Mack, the Executive Committee felt she had come to them with a rich background in office

continued on page 3

Meetings and Events

DISTRICT THREE MEETING

February 17, 2022 at 4 pm

Southwest Edgecombe High School 5912 NC HWY, Pinetops NC

For more information please contact Sue Farmer at 252.399.7823

2022 • 14TH ANNUAL WESTERN CONVENTION WORKSHOP

May 25 & 26, 2022

Ridgecrest Conference Center, Black Mountain, NC 613 Cherry, Street North Wilkesboro, NC 28659 For more information please contact Roxie Mack @ 336.366.4939

 $2022\, \bullet 50^{\text{TH}} \text{ANNUAL EASTERN CONVENTION WORKSHOP}$

September 21-23, 2022

Double Tree, Atlantic Beach, NC For more information please contact Roxie Mack @ 336.366.4939

MEETING DATES

The districts of NCPSMA meet twice yearly.

District 1
January, July
District 2
January, July
Pres. Ronald Moore
Phone: 910.296.1875

February, August Pres. Mark Letchworth Phone: 252.399.7822

District 4

District 3

February, October Pres. Donna Fields Phone: 910.678.2565 **District 5**

March, September Pres. Justin Dyson Phone: 336.909.2280 **District 6**

April, October Pres. Chris Adkins Phone: 980.343.4526 **District 7**

May, November Pres. Darryl Wagoner Phone: 336.667.2021 **District 8**

March, November V. Pres. Jason Kelly Phone: 828.456.2402

Meeting Dates & Locations

Should be sent to The Maintenance Beacon two months in advance for publication.

Deadlines

Publication deadline for articles and advertisements is first day of the month prior to month of publication.

INDEX OF ADVERTISERS

ACI Systems
ACR Supply Co4
Atlantic Coastal Supply, Inc
Davidson Sash & Door
D.H. Bruch Marketing, Inc
Duro-Last Roofing 7
Floor Action 4
Green Air Environmental 4
Hardware Distributors 5
Hoffman & Hoffman
James M. Pleasants Co
Ken Staley Co., Inc
Lewis Boiler Supply 7
Loman Garrett 4
Matt Marshall & Co 5
Pinnacle Dryer Corp 5
Reece, Noland & McElrath9
Richard K. Hunter & Co
Royalwood
Saffelle, Inc
Seating Safety Solutions
Seven Oaks Doors & Hardware 9
Seven Oaks Supply Co 6
Sky Enterprises
The Blind Butler/Premier Drapery 6
The Cook & Boardman Group
WC Rouse

DISTRICT THREE GOLF TOURNAMENT

NCPSMA District Three held their annual golf tournament on Friday, November 5, 2021. It was originally scheduled for Friday, October 29th but the weather did not cooperate. The event was held at Wedgewood Golf Course in Wilson, NC.

Participants enjoyed barbeque sandwiches donated by Parker's BBQ in Wilson. Beverages and snacks were provided by District Three. Bergie Speaks, NCPSMA State President, was in attendance again this year. He participated in the tournament again with his team from Wilkes County Schools. It was a very windy and cold day but we had a great turnout, a total of 80 participants in the event. Everyone had a good time, but we hope it will



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Construction Divisions: 8 & 10

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RETIREMENT ANNOUNCEMENT

continued from page 1

management and clerical skills and having an outgoing personality. As we all came to find out Mrs. Mack had stellar office and clerical skills, but I dare say her outgoing personality and passion that she has for this association is what is the driving force that has kept it going even through times when we feared it might crash along with the economy, not to mention the storms (literally and figuratively) she has pulled us through.

When Roxie started as Executive Secretary she worked along with Milton Rogerson who was the Maintenance Beacon Editor until his retirement from NCPSMA. Mr. Rogerson was the former Director of Publications at Barton College and former Managing Editor of the Sun Journal Newspaper in New Bern before coming to work for NCPSMA. At the time of Mr. Rogerson's retirement, Roxie's title changed and she now added Maintenance Beacon Editor to her multi-tasked hat.

Roxie's hat has changed many times over the years, Executive Secretary, Executive Director, Editor, Photographer, Convention Planner/Organizer, and that is just to name a few. But whatever we throw at her, she never bats an eye and grabs the bull by the horns and is ready for the new task at hand. Through the years NCPSMA has faced many challenges. We have had an economic boom where convention attendance and workshops were heavily attended and we did not have enough space for everyone wanting to attend (members and vendors alike). This of course was followed by the crash in the economy where many school systems weren't allowed to travel and we had low attendance at conventions. Which leads to us going from one convention to two conventions when the North Carolina Department of Public Instruction, Plant Operations Section, held their 50th Convention/Workshop at Mars Hill College they decided they were not going to hold any further conventions. So, we as an Association felt compelled to host another convention on the western end of the state so our maintenance employees would have an opportunity to receive credit hours without having to travel as much, all the while keeping costs lower for school systems during this time. She has had to move the ENTIRE Eastern Convention (accommodations and convention hall) in a two-week period because of a hurricane that closed the hotel or scrambled to find alternative accommodations for those attending because only half the hotel was going to be open because the other half was still drying out from the hurricane had just passed through.

Roxie, along with her trusty traveling partner Ron, attend all district meetings, state meetings, conventions and they even help with fundraising efforts in each district. At times her house/office can be filled with name tags, program agendas and other convention and NCPSMA items she is working on. And I have been known to call her at night and her and Ron are still working on things... like stuffing envelopes, name tags, cutting up tiny little papers with every member's name on it for a membership drawing, etc. even after the office is "closed."

As we contemplate on what the future will be when Roxie retires, we struggle to imagine a NCPSMA world without her in it. Roxie knows all the quirks, shortcuts, requirements, etc. that would take years for someone to "learn." We are tasked with finding a replacement and trying to instill years' worth of knowledge and love for the Association and its people into just a few short months. The task seems impossible. Although from time to time through the years there have been "meltdowns", a few kicked shins underneath the table to keep things going in the right order; there has mostly been a lot of prayer, great instruction, good times, fellowship and of course no one can deny that contagious laugh that we all love. Roxie is the epitome of what an Executive Director for the North Carolina Public School Maintenance Association stands for and we hope to keep our light shining as our "Beacon" ends her journey with us.

By Kristie Keener, Retired, Haywood County Schools

JOB DESCRIPTION

North Carolina Public School Maintenance Association Job Posting: Executive Director

A. Functional Purpose

The purpose of this position is to manage the finances, event planning, monthly publication, and other communications of the NCPSMA, in an effort to promote the Association Mission.

B. Duties and Responsibilities

Attends all meetings and be ready at any time to give impromptu,
 but accurate reports of the existing status of the activities relative to

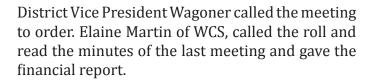
DISTRICT SEVEN MEETING

Wilkes County Schools (WCS) Maintenance hosted the District VII Fall meeting at the Stone Family Center on November 18, 2021.

Darryl Wagoner, District Vice President, welcomed everyone to the event and led in the Pledge of Allegiance. Mr. Craig Tidline, Boomer Ferguson Elementary School Principal, served as entertainment. He sang and was accompanied on the piano by Mrs. Debbie Coles, Minister of Music for Beulah Presbyterian Church in Wilkesboro.

Mr. David Martin, State Vice President, gave the invocation and a delicious meal catered by Olive Garden was served.

Following the meal District Vice President Wagoner introduced the guest speaker, Mr. Mark Byrd, WCS Superintendent. He noted Mr. Byrd received the NCPSMA Superintendent of the Year Award in September 2021. Mr. Byrd said, "This award belongs to the WCS Maintenance Department for all their efforts – especially during the most challenging, COVID." Mr. Byrd stated there have been health related issues in the past, but the constant availability of TV news and social media can make a challenging situation even more difficult. He noted his appreciation for all the maintenance personnel present and how they are willing to do what it takes.



Jeff Adams, District Seven Nomination Chairman presented the district officer nominations for the 2021-2022 Year as follows: President - Darryl Wagoner, Wilkes County Schools; Vice President, Chris Campbell, Alexander County Schools; Secretary, Robert Hoyle, Catawba County Schools; News Coordinator, Jeff Adams, Yadkin County Schools; Two Year Advisory Council Member, Michael Spillman, Davie County Schools; Gary Burdiss of Wilkes County Schools has one year remaining on the Advisory Council. The officers were elected as presented.

District President Wagoner recognized the vendors in attendance and conducted the door prize drawing. There were enough door prizes for everyone to receive a prize and to start over again. There we great raffle prizes awarded as well. We appreciate the generosity of our vendors!

By Ron Mack



Darryl Wagoner



Mr. Craig Tidline



Mrs. Debbie Coles



Mrs. Elaine Martin



Mr. Mark Byrd



Attendees



Darryl Wagoner and Vendors



Attendees



Attendees



New officers - 1-r: Chris Campbell, Robert Hoyle, Darryl Wagoner, Gary Burdiss, Jeff Adams, Michael Spillman



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49TH ANNUAL NCPSMA EASTERN CONVENTION EXHIBITOR PHOTO



Accidentally left out of the December issue



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JOB DESCRIPTION

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the association and the monthly publication.

- Performs all work necessary for the gathering of news items, selling of advertising space in the monthly publication, contacting superintendents and others for their ideas, keeping up to date and accurate records of all subscriptions and advertisements, informing association members of duties expected of them and performing any and all other duties necessary to produce a good publication.
- Maintains a morgue containing all pictures or new items of the North Carolina Public School Maintenance Association with cross-reference labels for future use (which should be kept to date).
- Maintains records of all transactions, subscriptions, advertisements, memberships, potential advertiser list, disbursements and other records necessary to all posting up to date and see that all proper bills are paid on time; answer all required correspondence promptly.
- Informs the executive committee or other appropriate committees of any irregularities, which cannot be completely dealt with at this level or of any incident, which these committees should be informed.
- Collects and records all association membership dues and/or other funds.
- Disburses all such funds upon the authority of the advisory council.
- Provides quarterly reports to the finance committee prior to the regularly scheduled advisory council meeting.
- Builds and/or maintains the best possible reputation for the North Carolina Public School Maintenance Association.
- Works harmoniously with any committee, which the president or advisory council may see fit to appoint.
- Serves as the registered agents of the corporation and shall notify the Secretary of State of any required changes
- Plans and attends two conferences each year (Eastern and Western). This shall include all correspondence with the venues, vendors, catering companies, districts and officers. Event planning such as registration, advertisement, workshops, speakers, etc. will be part of these duties. Tentative agenda will be completed at the convention planning meeting and approved by the advisory council six months prior to the conference.
- All other duties as assigned.

C. Required Knowledge Skills and Abilities

- Ability to interact professionally with vendors to establish relationships gaining support for the NCPSMA.
- Be available to assist the association president and all district presidents in the establishing and the conducting of association or district meetings.
- Ability to work independently without direct supervision.
- General knowledge of office practices, procedures, and methods.
- Ability to set own work priorities and be flexible in adjusting workload and variety of tasks assigned.
- Ability to plan and organize work to meet established deadlines and professional staff requirements.
- Ability to quickly learn the general organization and operations of the NCPSMA.
- Ability to complete and handle accurately and confidentially records and files.
- Ability to evaluate existing programs and procedures and make recommendations for improvement.
- Ability to accurately interpret state and federal regulations and NCPSMA By-Laws.

MEMBER Please mail this form with your dues paym NCPSMA, 630 Adams Ridge Road, State	
Name	,
Address	
City	State Zip Code
Telephone () Email	
School System	District
Company(Individual memberships only-no 'company	y' memberships)
If you would like a reminder sent to your e Maintenance Beacon is available online, p	-mail each month when the latest edition of the lease check below.
Yes I would like a reminder	sent

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DISTRICT THREE GOLF TOURNAMENT

be much warmer next year.

it without her.

The Hoffman and Hoffman Team (Allen Sherrod, Mike Norville, Scott Norville and Kyle Norville) took first place with a score of 57. Their prize was a \$50 gift certificate for each player from Wedgewood. The KC & The G's Team(Kenny Boyette, Clyde Boyette, Greg Nash and Greg Street) took second place with a score of 59. Their prize was a \$40 gift certificate for each player from Wedgewood. The Pray For Rain Team (Tommy Kirkman, Denny Donaldson, Scott Waters and Todd Ramsey) took third place with a score of 62. Their prize was a \$30 gift certificate for each player from Wedgewood. The longest drive, hole #14, was awarded to Bruce Norman with the Bell's/Baker Team. Closest to the pin, hole #5, was awarded to Mike Norville with the Hoffman and Hoffman Team. The winners were each given a \$25 gift card to Lowe's donated by Service Roofing and Sheet Metal. Thanks to Donna Ritterpusch with Nash County Schools for donating her time and taking these great pictures. I could not have done

Many thanks to the hole sponsors of the event and donations that were made. Those included: ACI Systems, Inc., Atlantic Coastal Supply, Baker Distributing, Carpets By David, Inc., Central Building, Eastern Electric Supply/Rocky Mount, Envirocon, Inc., Flexco Floors, Garris Evans, Hoffman and Hoffman, Moye Fence Co, Inc., NSB, Inc., Progressive Design Collaborative LTD, Saffelle, Inc., Service Roofing & Sheet Metal Company, Skinner Farlow Kirwan Architecture, PA, Southeastern Diesel Sales & Service, SPC Mechanical, United Refrigeration, Water Guard, JP Weaver Inc., Wilson Glass and Wolf Trail Engineering PLLC.

Thanks to everyone for their contribution in making this tournament a huge success. Volunteering their time were: Mark Letchworth and Sue Farmer with Wilson County Schools. Everyone is looking forward to next year.

By Sue Farmer, NCPSMA District Three Vice President Wilson County School Maintenance Secretary/Bookkeeper



First Place



Second Place



Third Place





Bergie Speaks & Tommy Spicer



Sue Farmer and Her Nephew Clyde Bottoms



Sue Farmer and Mike Norville





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JOB DESCRIPTION

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- Ability to establish and maintain effective working relationships with membership, committee members, leadership, and vendors.
- Proficient in Microsoft Office Suite.

D. Education and Experience Requirements

Associates Degree in Business Administration, Office Management, Public Administration or equivalent and four years' experience in office management, public administration or related field; or graduation from high school and six years of office management, public administration or related field; or an equivalent combination of education and experience.

E. Special Requirements

- Valid NC Driver's License
- Furnish an office or workspace for all the equipment and supplies needed to perform said duties of the Executive Director. Including a landline telephone. (Stipend is provided for this expense)
- Ability to be continuously bonded in a minimum amount of \$50,000 (cost of such bond to be paid from the association treasury).
- Maintain a vehicle for travel between districts and other events (mileage reimbursement provided).

F. Physical Work Demands

Physical Activity	Frequency C-Constant F-Frequent O-Occasional I-Infrequent NR-Not Required	Physical Activity	Frequency C-Constant F-Frequent O-Occasional I-Infrequent NR-Not Required
Climbing/Balancing	I	Lifting/Carrying	O up to 50 lbs. NR up to 75 lbs
Crawling/Kneeling	0	Grasping/Twisting	I
Walking	F	Reaching	F
Running	NR	Pushing/Pulling	F
Standing	F	Fingering/Typing	С
Sitting	С	Driving	F
Bending/Stooping	F	Others:	

To apply for this position, please send your resume and cover letter to Mr. Michael Spillman, NCPSMA Executive Committee Chairman at spillmanm@davie.k12.nc.us

Executive Director: Roxie Mack Phone: 336.366.4939 Fax: 336.366.4938 E-Mail: roxiermack@gmail.com Website: www.ncpsma.org

The Maintenance Beacon is the monthly publication of the North Carolina Public School Maintenance Association. Advertising, editorial material, memberships and subscriptions are handled through the office of the Executive Director, 630 Adams Ridge Road, State Road, NC 28676-9536.

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Officers of the Association

President Vice President Secretary Liasion Officer Bergie Speaks David Martin Justin Dyson Mark Letchworth

336 667 2021 704.658.2630 336.909.2280 252.399.7822

WSHP SYSTEM DESIGN

PART FOUR: WATERSIDE ECONOMIZING MIGHT NOT IMPROVE EFFICIENCY

By Chad Edmondson

Just about every major water source heat pump (WSHP) manufacturer now offers equipment with an integral waterside economizer, no doubt to give engineers a straight forward path to meeting the following ASHRAE 90.1-2013 requirement for air or waterside economizing:

ASHRE 90.1 V	Waterside Economizers Requirements
CHAPTER 6: HEATING, VENTI	LATING, AND AIR CONDITIONING, SECTION 6.5 Prescriptive Path
6.5.1 Economizers. Each cooling meeting the requirements of Sec Exceptions: Economizers are not requ	50000000000000000000000000000000000000
TABLE 6.5.1A Minimum Fan-Cooling Unit S	size for Which an Economizer is Required for Comfort Cooling
TABLE 6.5.1A Minimum Fan-Cooling Unit S Climate Zones	Cooling Capacity for Which an Economizer is Required
VISA SECTION OF CO.	

however, while the economizer requirement applies to just about every climate zone in the US, a closer read of the standard shows it is very likely not required on the majority of multi-zone commercial WSHP systems. If the cooling efficiency of the WSHP unit meets or exceeds the efficiency improvements requirements shown in ASHRAE Table 6.3.2, an economizer is not required.

Table 6.3.2 Eliminate Required Economizer for Comfort Cooling by Increasing Cooling Efficiency

	Climate Zone	Efficiency Improvement ^a
[2a	17%
ĺ	2b	21%
•	3a	27%
	<u>3b</u>	32%
Ì	3c	65%
•	<u>4a</u>	42%
	4b	49%
	4c	64%
Ī	<u>5a</u>	49%
	<u>5b</u>	59%
	<u>5c</u>	74%
ſ	<u>6a</u>	56%
	<u>6b</u>	65%
Ī	7	72%
Ī	8	77%

a If a unit is rated with an IPLV, IEER or SEER then to eliminate the required air or water economizer, the minimum cooling efficiency of the HVAC unit must be increased by the percentage shown. If the HVAC unit is only rated with a full load metric like EER or COP cooling then these must be increased by the percentage

Currently there is very limited information about what efficiency gains an economizer might yield over the efficiency of the WSHP system itself. In fact, it may actually increase long term operational cost, not to mention system complexity. Fortunately, ASHRAE 90.1 includes exceptions within the standard that give engineers plenty of room to prioritize the efficiency of the overall system over the singular strategy of an economizer. But before we get to that, let's explore what makes these two energy saving strategies potentially incompatible.

Water Temperature Requirements: Economizer versus operating in the WSHP Dead Band

The point of conflict between typical WSHP operation and WSHP economizer operation is likely to occur when it is cold outside, but part of the building still needs cooling.

If the system has been designed to operate in accordance with ASHRAE 90.1-2013 Section 6.5.1.2, then the fluid economizer would provide up to 100% of the expected system cooling load whenever the outdoor temperature drops to 50°F dry bulb/45°F wet bulb or below. In order to provide full cooling, the economizer in each unit may require supply water temperature to be as low as 45°F. Meeting this requirement means resetting the WSHP loop temperature below the preferred dead band temperature range (typically 50°F to 90°F) of system until cooling is no longer required. This sidelines the most valuable asset of a WSHP system, its battery

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JAY PALMER SCHOLARSHIP APPLICATION

2022 Application for Jay Palmer Scholarship North Carolina Public School Maintenance Association Applications must be postmarked by February 28, 2022 Completed application should be mailed to: John Labban, Scholarship Chairman C/O James Palmer, III Jay Palmer Scholarship Fund

6735 East Old US Hwy 64

Lexington, NC 27292-9000		
A. APPLICANT INFORMATION:		
Full Name		
*Address	State 7	
Phono () *E mail add	State Z	ıp
City_ Phone ()*E-mail add Date of BirthAge _	Coolel Coourity #	
Applicant Employer	300iai Security #	
Applicant Employer		
Approximate Salary:	#20 004 #20 000	
\$0-\$10,000\$10,001-\$20,000		
\$30,001-\$40,000 \$40,000-above		
Current Member of NCPSMA yes		latad annii antian
*Please include a copy of current NCPS		
Note: if applicant is employed by an LE	A Maintenance Department and A	Active member of
NCPSMA, Item C. is not required.		
D. 4 DDI 10 4 N T O DOLLO E IN EO DA 4 T IO	N. (16 11)	
B. APPLICANT SPOUSE INFORMATIC	` ' '	
Full Name		
Address		
City	State	
Applicant Spouse Employer		
Work Phone Number		
Approximate Salary:		
\$0-\$10,000\$10,001-\$20,000	_\$20,001-\$30,000	
\$30,001-\$40,000\$40,000-above	9	
C. APPLICANT'S PARENT INFORMATI		
Father	Mother	· · · · · · · · · · · · · · · · · · ·
Address	Address	
City State	City	
State	State	
Zip	Zip	
Employer	Employer	
Work Phone	Work Phone	
Home Phone	Home Phone	
Father E-mail address		
Mother E-mail address		
Current Member of NCPSMA yes	no * District #	
*Please include a copy of current NCPS	MA membership card with comp	leted application.
D. If applicant is a Dependent Child or A		combined)
\$30,000-\$40,000\$40,001-\$50,0	000\$50,001-\$60,000	
\$60,001-\$70,000 \$70,001-\$80	000\$80,001-\$90,000	
\$90,001-\$100,000\$100,001 an	d over	
E. Please list other family members (sib	lings, parents, spouse, etc.) atter	nding school/college
Name & Relationship	School/College_	
Name & Relationship Expected Graduation Date	Age	
F. *High School Applicant Attended/Atte	ndsYear of Co	ompletion
G.College Attending or Applied to and A Years Attended Year to Begin	ccepted	
Years Attended Year to Begin	*Student ID#	
Address* of college or university/accept	ad ta	
*Where to send the check made out to t		
*Include a copy of original acceptance le		ent that is proof of con-
tinued acceptance(if 2nd,3rd, or 4th year		•
	•	
H. List other sources of Financial Assist	ance	

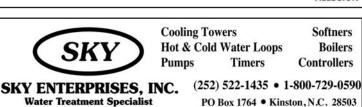
- I. *On a separate sheet, list applicant's extracurricular activities including, but not limited to academic, church, community, etc.
- J. *Briefly convey in 200-500 words on a separate sheet your hopes, wishes and desires for your academic and professional future, along with why you chose the college you plan to attend. Please fill out completely and honestly.
- K. PLEASE Include information with a * we need complete applications!

Incomplete applications will not be considered.

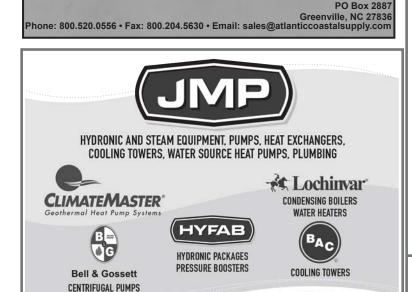
Recipients will be announced or notified by the end of June each year. If awarded scholarship, check will be written to the school and applicant, mailed on or about the first week of August of award year.

Completed application should be mailed to: John Labban, Scholarship Chairman C/O James Palmer, III Jay Palmer Scholarship Fund 6735 East Old US Hwy 64 Lexington, NC 27292-9068









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WSHP SYSTEM DESIGN

PART FOUR: WATERSIDE ECONOMIZING MIGHT NOT IMPROVE EFFICIENCY

continued from page 8

capacity.

If we reset a WSHP loop to 45°F, then the heat pumps that are in heating mode become less efficient. Simultaneous heating and cooling is the key to WSHP system efficiency. This is what allows us to maximize the battery capacity of the water loop while minimizing the use of the cooling tower and boiler.

The efficiency penalty for resetting the loop temperature to 45°F can be significant. If the coefficient of performance (COP) for operating a WSHP at 70°F is 5.9, the COP for the same system drops to 3.6 at 45°F. This could actually interfere with ASHRAE 90.1-2013 compliance since Section 6.5.1.5 Economizer Heating System Impact states that the HVAC system design and economizer control shall be such that economizer operation does not increase the building heating energy use during normal operation.

Here are a few other things to consider before including waterside economizers in your WSHP system design:

- The addition of a waterside economizer coil increases the pressure drop through each zone. (Note: ASHRAE 90.1-2013 Section 6.5.1.5 Maximum Pressure Drop states that the water-to-water heat exchanger used as part of the economizer shall be less than 15' or an additional secondary loop must be created with its own recirculation pump.)
- The economizer coil also creates additional airside pressure drop through the unit. This pressure drop will exist whether we are operating in economizer mode or not.
- Operating in economizer mode means operating the cooling tower to make 45°F water, regardless of the season. This gets complicated (and more expensive) in winter since cold air holds less moisture. Approach and wet bulb temperature become critically important for effective operation of the cooling tower in winter. And remember, under normal WSHP operating conditions, you typically would not have to operating the cooling tower at all in the winter as long as the loop stays within dead band.
- What is leaving water temperature off WSHP in heating mode? If we bring 45°F to a WSHP



WSHP SYSTEM DESIGN

PART FOUR: WATERSIDE ECONOMIZING MIGHT NOT IMPROVE EFFICIENCY

continued from page 9 in heating mode the leaving water temperature

- could be in the 30's.

 Do you need a glycol system to keep the system
- from tripping out due to low water temperature?
- What is your operational sequence? Again, this gets tricky in winter. Remember, the economizer is expected to provide partial cooling even when mechanical cooling is in operation.

How to Eliminate the Economizer Requirement If It Doesn't Make Sense

As we stated early, you do have options when it comes to meeting ASHRAE 90.1-2013 without having to implement waterside economizing in your design.

In our part of the country, Climate Zones 3a and 4a (North Carolina, South Carolina, Tennessee, Georgia, and Alabama), the cooling efficiency of the system must be improved over code by 27% or 42% respectively to avoid the economizer requirement. We've created an easy cheat sheet to help you determine if the WSHP equipment you select for your application will allow you to meet these efficiency improvements in these zones. Click here to download the document for Increased Efficiency Requirements for Elimination of Waterside Economizers in Zones 3A and 4A.

You can also model the system using the Energy Cost Budget Method described in ASHRAE 90.1-2013 to compare the overall energy of the system you are designing with and without an economizer, regardless of what type of heating and cooling system you are using. This can be found in Section 11.1.1 Energy Cost Budget Method Scope and will let you evaluate whether an economizer would be more efficient for your application.

As discussed, each application should be considered individually to see if a water side economizer makes sense. Factors such as building type, load profile, occupancy and location need to be considered. A detailed list of exceptions can be found ASHRAE 90.1-2013 Section 6.5.1 and should be consulted.

Remember a WSHP system is naturally an economizer by design. This is because you can turn off the mechanical heating and cooling equipment while operating within the dead band and run off your hydronic battery. The larger the dead band the larger your battery.

Next up we will look at tips to help you design the best water source heat pump system for you application.

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DISTRICT SEVEN SCHOLARSHIP ANNOUNCEMENT

Thank-you for your interest in the District Seven Scholarship. We will award a minimum of one scholarship in the amount of \$500.00 annually. The newest recipient(s) will be named during the District Seven Meeting in May of 2022.

Applicants must meet the following requirements:

- 1. NCPSMA District Seven current active, associate or retired member (minimum of one year) or their immediate family.
- 2. Financial Need

A. Applicant

- 3. Acceptance by college, university or technical school
- 4. Completed application. <u>If application is not complete and accurate it will not be considered.</u>

In addition to the completed application, on a separate sheet please list applicant's extracurricular activities including, but not limited to academic, church, community, etc.

Briefly convey in 300 words or less your hopes, wishes and desires along with why you chose the college or continuing education program you plan to attend.

<u>Include copy of current membership card with application.</u>

Include a copy of current membership card. Application must be postmarked by March 11, 2022 and mailed to Tim Pruitt, 689 Maple Grove Church Rd, Hays, NC 28635

DISTRICT SEVEN SCHOLARSHIP APPLICATION

Dl. . . .

Application must be complete and accurate or it will not be consid-

F. Finance assistance	applied for or	received	from other sources	
Name	College or So	chool	Year to Graduate	Age
E. Please list other far	mily members	attendin	g school/college, etc	
If YES, how long have y	ou been a mem	ber		
Current Member of NCI	PSMAYES _	NO		
Employer				
			to Applicant	
D NCPSMA Mambar			if other then self or pa	ront
Parents Combined Sala			\$40,001-\$60,000	
If YES, how long have y			 ¢/∩ ∩∩1 ¢/∩ ∩∩∩	
EmployerCurrent Member of NCI				
			one	
Name of Mother				
If YES, how long have y				
Current Member of NCI				
Employer	DCMA VEC	NO		
			one	
Address		*** ' ='		
Name of Father				
C. Parent(s) of Applica	_		_	
If YES, how long have y				
Current Member of NC				
	\$30,001-\$40		_\$40,000+	
Approximate Salary _				
Work Phone Number				
Address (if different fro	om applicant) _			
Spouse				
B. If Applicable				
Years Attended	or Year to Be	egin		
College Attending or Ap	oplied to and Ac	ccepted		
Year of Completion				
High School Attending/	'Attended			
	\$30,001-\$40			
Approximate Salary	\$0-\$20,000)	\$20,001-\$30,000	
Applicant Employer				
		Social :	Security #	
Address		P.	none	
Applicants Name		P.	none	

Include a copy of current membership card. Application must be postmarked by March 11, 2022 and mailed to Tim Pruitt, 689 Maple Grove Church Rd, Hays, NC 28635