

# Class Descriptions

42<sup>nd</sup> LMS Seminar — April 16-18, 2019

## A-0 How One Child's Loss Lead to Paradigm Shift in Chairlift Operations

Mark Petrozi •

*When 7-year old John Henderson died after a fall from a chairlift at Sugar Bowl Resort near Lake Tahoe in 2011, he became the first and only child fatality resulting from a fall from a chairlift in the United States. But his loss was not in vain—his parents, Dr. Mark Henderson and Dr. Helen Chew—worked proactively with Sugar Bowl to help the resort re-think and overhaul the resort's chairlift loading procedures, ushering in to the industry some of the most thoughtful and comprehensive practices and procedures to improve guest safety on lifts. The family's willingness to share their story and their heartache underscores their sincere commitment to improving chairlift safety for everyone, and emphasizes how Sugar Bowl turned this tragedy into a progressive chairlift safety program. We'll address this incident, unique issues with children and lifts, and how Sugar Bowl took responsible steps that became a model for other resorts to emulate*

## A-1 AC Electric Motors

Dave Cunningham • Applied Dynamics

*One of the most critical parts of your operation is the A.C. motor. This class will explain the different types of A.C. Electric Motors used at your Ski Area. The construction, operation and recommended maintenance for your motors will be discussed. Particular attention will be paid to the requirements for today's use with a VFD.*

## A-2 Basic Electrical Circuits - Part I

Bruce Wyman • S-K-I Electric

*We will begin by understanding the terms used in electrical theory, and understanding the relationship of Voltage, Current, Resistance, and Wattage. We will then move on to the three fundamental electrical circuits, Series, Parallel, and Series/Parallel to begin to understand circuit paths and how they work.*

## A-3 Gear Box Fundamentals, Inspection & Repair Procedures

Tim Brockett • Artec Machine Systems

*Gear Box Fundamentals & Applications, Modes of Failures and Preventative Maintenance Tips, Gearbox Inspection Techniques, Repair Procedures*

## A-4 Let's Talk Lift Inspections

Mike Nellis • State of Vermont

*Each State will explain how they do inspections. What inspectors look for? How many on staff and what it takes to become an inspector? How each state deals with New Lifts, Modifications, Write ups, etc? Bring Your Questions!*

## A-5 LEGENDS OF THE FALL: Now what? Hands-on Fall Rescue Training

Tony Kowalski • HoliMont Ski Area

*Your Area may be up to speed on Fall Protection, but how much thought has gone into developing a rescue plan should a fall occur? This session will address how to develop a written rescue plan that satisfies ANSI and OSHA requirements. Topics will include: Suspension Trauma, types of rescue equipment, hands-on scenarios and how to properly inspect your Fall Protection and Rescue equipment. This class will be presented outdoors at a lift. Bring your own Fall Protection/Rescue equipment for inspection and discussion*

## A-7 Using Metrics to Improve Maintenance and Staff Engagement

Bob Ackland • Steep Management, LLC

*Audience should be those with supervisory responsibility. Attendees will understand how they can deepen the engagement of their staff to take ownership of their work. The value of metrics will be discussed as tool to engage in a positive way with their staff to enhance retention probabilities and to increase the overall productivity of the maintenance department.*

## A-8 The Math of Making Snow:

### What Every Snowmaker Needs to Know!

Ian Jarrett • HKD Snowmakers

*Given the many challenges brought on by climate change, competition and the overall demands of the skiing public, snowmaking is the most critical discipline for almost every resort in North America. As snowmakers, we must strive to understand our craft. The basic principles of snowmaking and their importance to the survival of the ski industry are what drove innovators such as Herman K. Dupre (HKD) to pursue greater levels of efficiency and performance. In this session we will address the essential metrics and principles that continue to be the basis of success (and failure) in snowmaking.*

## B-1 Arc Flash Prevention and Protection

Jim Lanz • Horizon Solutions

*Identifying ArcFlash hazards - NFPA 70E and what to do next and to protect yourself.*

## B-2 Basic Electrical Circuits - Part II

Bruce Wyman • S-K-I Electric

*We will begin by understanding the terms used in electrical theory, and understanding the relationship of Voltage, Current, Resistance, and Wattage. We will then move on to the three fundamental electrical circuits, Series, Parallel, and Series/Parallel to begin to understand circuit paths and how they work.*

## B-3 Sunkid Wonder Carpets

### Maintenance, Operation, and Troubleshooting

Conor Rowan • Star Lifts, USA

*Panel with Pete Kavanagh; Dan Etman - Green Mountain Control Systems  
The class will cover all things Sunkid Maintenance, Operation, and Troubleshooting.*

## B-4 Concerned About Aging Lifts and Other Mechanical Equipment?

Neville Sachs, P.E. • Neville W. Sachs, P.E., PLLC

*Many of our ski lifts are over thirty years old and much of our other machinery is aging. This presentation reviews the common causes of mechanical deterioration, including corrosion, what we can do to prevent further degradation, and some steps we can take to improve their mechanical reliability. There will be comments on the effect of corrosion and also data on the safety and planning benefits of predictive maintenance. Level II*

## B-6 Maintenance Training Guideline

Michael Lane • National Ski Areas Association

*Update on the Maintenance Guideline that NSAA is working on to help areas with their training need for their maintenance training program.*

## B-8 TechnoAlpin Fan Gun Summer Service

Stuart Clotworthy • TechnoAlpin USA, Inc.

*Aimed at service technicians working at ski areas, no special tools required.*

## C-0 Jiminy Roundtable - Little Shop

Michael Lane • National Ski Areas Association

*Michael Lane, and others from insurance, authorities, and maintenance personnel. The year in review! What went "right and wrong," trends that have been noticed concerning Ropeways, and the people who maintain and operate them.*

## C-1 DC - Electric Motors for the Mechanic

Karl Butz • Troy Industrial Solutions

*Prior to the introduction and increase use of VFD's, the Direct Current (D.C.) motor was the motor of choice for infinite speed control of small and large Lifts. An overview of the characteristics of D.C. motors, the construction, operating parameters and recommended maintenance will be presented. Discussion will also include the myths of continuing to use a D.C. drive.*

## C-2 Bearing Protection for Electric Motors &\* Reducing Downtime

Tom Leunig • Helwig Carbon Products

*We will present a solution to pre-mature bearing failure in AC and DC electric motors, especially when used with drives. Motors controlled by drives save energy, but they also create induced shaft currents that will discharge through the bearings and cause expensive downtime. Attendees will learn about this problem and a low cost and effective solution that will save money from costly motor repairs and ski area downtime.*

*Audience: Lift maintenance personnel involved with electric motor/equipment maintenance & repair. Maintenance Managers.*

## C-4 Conveyor Safety - During Maintenance and Operations

Sam Geise • Geise Engineering

*Panel with: Conor Rowan, Sam Geise, Ross Stevens and Michael Lane - Changing our culture with respect to Conveyor Safety*

*Conor Rowan - Star Lifts*

*Pete Kavanagh - Star Lifts*

*Mike Lane - NSAA*

*Sam Geise & Audrey Archuleta - Magic Carpet Lifts*

*Sam Geise will facilitate this session. Conveyor Safety and how to implement protocols, best practices, procedures to reduce the risks to maintenance and operational personnel is the main focus of this session. To many people are getting injured while performing maintenance and routine operations on these installations.*

## C-5 Adaptive Evacuation Workshop

Mary Davis • ASC B77 Evacuation Subcommittee

*Review of the "common adaptive equipment", interfacing it with resort evacuation and the ANSI/RESNA Standard. This session will include hands-on with adaptive equipment and demo of evacuating skiers using adaptive equipment as well as an opportunity to share adaptive evacuation procedures at various resorts.*

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## C-6 Practical Applications of Bearings in the Ski Industry

Steve Greene • Action Bearing Company

Lifts, Groomers, Pumps, compressors, Etc. all have bearings. This will be a dialog based discussion

on bearing applications in the ski industry. Bring your questions, and stories from the field for sharing..

## C-7 Basic Ski Lift Math and Physics

Ross Stevens • Stevens Engineering

Bring a simple calculator +/- / SQ Root (Check your cell phone)

Presenting practical math applications for ski lift technology including photos, formulas and sketches of the basic things you need to know about.. Your opportunity to ask questions, discuss concepts and understand fundamentals. This course is for anyone who wants to know more about an important tool we use every day and including mechanics, supervisors, inspectors and authorities. Bring any math issues you want to discuss.

## C-8 Maintenance in the Ski Area - the real relationships and dependencies within the ski area

Bob Ackland • Steep Management, LLC

Audience should be those with supervisory responsibility. Attendees for Maintenance in the Ski Area will get a sense of relationships and dependency with and on others in the ski area for success and see the relationship of maintenance with the outside factors that impact their work as well as factors that impact the total performance of the ski area. The class will develop the relationships of a maintenance task/ position up through the workings of the ski area. This will be done using functional relationship mapping to visually connect the dots.

## D-1 Variable Frequency Drives (VFD's)

Bob Twohill •

Poly-phase (3Ø) motors are used in all aspects of today's ski area operations.

Increased usage in speed control applications for Lifts, Snowmaking, and Building HVAC applications make understanding the basics useful. Discussion will center on the construction and operation of VFD's.

Bob will explain the theory of operation, application, and installation parameters of the VFD drive.

He will discuss with you the advantages and disadvantages of using a VFD and possible pitfalls.

## D-2 Transformers Part I

Bruce Wyman • S-K-I Electric

These classes will help you understand the different styles of electrical transformers, you might find in you installations. Discussion will include single phase, three phase, wye connected, delta connected transformers, as well as Potential Transformers, (PT's), Current Transformers (CT's), and control transformers.

## D-3 Introduction to Wire Rope

Sam Geise • Geise Engineering

Terminology, constructions, use;

How wire rope is made;

Basic inspection & Math (Broken Wires, etc) MRT;

ANSI B77 Requirements.

## D-4 Ski Area Lubrication - Where we've been and where we should be Going

Neville Sachs, P.E. • Neville W. Sachs, P.E., PLLC

The class will show how lubrication works, starting with base oils and additives. then describe the lubrication of different types of bearings and sliding surfaces and the effect of contamination. After reviewing those basics, it will cover the changes in lubricants including the various synthetic oils and the grease thickeners. The last portion of the program will discuss setting up a lubrication program with suggested relubrication periods and storage practices.

## D-6 The Fundamentals of Fasteners

Michelle Pesanelli • Bolt Depot

Panel with Jason Bourque and Paige Mathewson

This is an introduction to identifying and sizing fasteners. Student will learn how to distinguish fasteners by type and materials and learn how to size them. They will learn to recognize the difference between US and Metric fasteners.

## D-7 LEGENDS OF THE FALL: Now what ? Hands-on Fall Rescue Training

Tony Kowalski • HoliMont Ski Area

Your Area may be up to speed on Fall Protection, but how much thought has gone into developing a rescue plan should a fall occur? This session will address how to develop a written rescue plan that satisfies ANSI and OSHA requirements. Topics will include: Suspension Trauma, types of rescue equipment, hands-on scenarios and how to properly inspect your Fall Protection and Rescue equipment. This class will be presented outdoors at a lift. Bring your own Fall Protection/Rescue equipment for inspection and discussion

## D-8 SMI Spring Time Maintainece

John Parker • SMI Snow Makers

Tips and Tricks for everyday trouble shooting and repair. Panel Discussions with Dan Triantafillou.

## E-1 Selecting the right Fuses

Christina Rosati • Eaton Bussmann FuseE-2

Transformers Part II

Bruce Wyman • S-K-I Electric

With the increased use of airless snowmaking, and power company variables, some Ski areas are having to upsize their Secondary Distribution System. We will discuss the different type of Transformers, sizing, connection styles and general over-all usage.

## E-6 Advanced Torque Training

Joel Greene • Snap On Industrial

In this presentation we will go over the history of torque instruments, proper torque application, and choosing best tool for the job.

## E-7 Advanced Ski Lift Math and Physics

Michael Lane • National Ski Areas Association

Advanced Ski Lift Math and Physics – no calculator needed – over view and design understanding. The class contains a brief refresher on simple lift calculations such as capacity, speed, intervals, then moves to understand why certain Lift configurations are more costly, then expanding to what actually happens in the design process based on ski area input. The 201 and 301 Class for Lift Math.- an overview w/ enough detail to get you thinking.

## F-1 Multi-meters

Andy Pierce • Skytrac, Inc.

One of the most important pieces of equipment you will use is your multi-meter. Andy will introduce you to the various types, the right one to use for the job, and how to do it properly. Bring your multi-meter and let Andy show the proper techniques as you walk around circuits.

## F-2 Lightning/Surge Protection & The Coordination of Technologies

• MeterTreater, Inc.

This presentation is geared towards electrical lift maintenance personnel and reviews the applications of Surge Protection as it relates to issues associated with operating electrical systems in real world environments. Material covered will provide insight on what to protect, how to select the technology/protector and where to interface/install with specific emphasis on application coordination. Discussions will include lift operating systems, drives, proximity (PROX) switches, weather instrumentation, security systems (access control, video & alarm), plus computers and communications networks. Grounding and bonding principles will be reviewed due to their critical relationship to system performance and personnel safety

## F-4 Introduction to Brakes - 101

Michael Lane • National Ski Areas Association

This class will look at the different types of brakes, their physical characteristics, components, nuances, and adjustments. The session then applies the different brake types as they are used on ropeways and attempts to give an overview to help you understand their operation and how they relate to the requirements of the B77.1 Standard.

## F-6 Operational Impacts of changes in ANSI B77.1-2017 on fixed and detachable Chairlifts

Mary Davis •

What's New and what has changed in the operational and signs requirements since the approval of ANSI B77.1-2017 Ropeway Standard. This session will update attendees on changes that will affect all lifts, not just new installations, major modifications, or relocated lifts.

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## F-7 Evacuation Planning - What's New - What's Different?

Mary Davis • ASC B77 Evacuation Subcommittee

*B77.1-2017 has changes in the evacuation requirements. This session will address what has changed (and why) along with the history of the evolution of evacuation equipment and "best practices" as impacted by OSHA and other standards.*

## G-1 Lift Electric Roundtable

Andy Pierce • AP Electrical Service, LLC

*This is an open forum for all those who practice the "Dark Art of Lift Electronics". All skill levels are welcome. We will discuss all flavors of Lifts, Snowmaking, and other electrical challenges. Please bring your questions, ideas, and anything else you would like to talk about.*