Update On Ergonomic Tools
2012

Northeast Gas Association
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Areas of Concern

Slips/Trips/Falls
Working around the vehicle
Lifting/Loading
Wrenching
Barholing
Pavement Breaking
Excavation
Presentation is in two parts

1) NYSEARCH Ergonomics Project with several items of interest

2) Other other ergonomic tools and applications
Objective/ Approach of the NYSEARCH project

To find, improve or develop tools/methods for field operations

Reduce injuries and improve productivity

Approach

• Conduct and document a wide scale search
• Design, test, field evaluate, and deploy with member companies
• Document results, analyze productivity improvements and reduced injury data
• Share results with funding members
# Tools / Equipment Selected

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<th>Con Edison</th>
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<th>National Fuel</th>
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ICE CLEATS

Develop new strap-on ice-cleats or ice shoes/boots specific to our needs. The cleats may be retractable. They need to be more user-friendly. Evaluation will include the ErgoMate Ice-R. The benefit of this work would be reduced slips, trips and falls. Depending on the availability of existing prototypes and the interest of manufacturers the deliverable is either a functioning piece of hardware or pre-commercial concept prototypes.
Preliminary field trials but not enough ice
Improved “Anglefin” Plunger Bar

Develop second generation Anglefin plunger bar with probable improvements in vibration isolation, a longer handle, a wider spread between the arms, and adjustable weights. Include necessary ergonomic analysis. The benefit of this work would be to improve the ergonomics of bar driving. The deliverable is one or two prototypes.
Improved Anglefin

Ergonomic Analysis will be done by the University of Utah Ergonomics Group this summer.
Minnich Drill

Field evaluate modified Minnich Mfg drill for street drilling leak detection holes. Drill depth to be 24” or 36”. The benefit of this work is to make available a much lighter weight wheeled drill than the existing EZ-Drill which will increase use and reduce injuries from the use of hand held devices. Deliverable is one or two prototype drills that will be either commercially available or very close to commercial.
Demonstration at Nisource - Video
Anderson Bar Puller

Perform field trials for modified Anderson bar puller. Modifications are to the handle for easier and more compact storage and transport. The benefit of this work is to provide an alternative to the existing bar pullers that improves body position, lowers the amount of force needed, and doesn’t bend the probe bar. The deliverable is two prototype devices very close to commercialization.
New Anderson Bar Puller

• 16:1 mechanical advantage pulls probe rods, stuck drills, grounding rods

• 2” pull per stroke

• Doesn’t bend the bar – unique double jaw action

• Don’t have to push your arm to the ground

• Weighs only 25 lbs.

• Available in two jaw ranges. If you only use a ½” rod then buy the “narrow” 1/2” to 7/8” model to maximize the pull per stroke. If you use larger bars or a variety of bars use the “wide” model with the larger 1/2” to 1-1/4” bar range. It is optimized for the 1” hex bars.

• Easy to use, easy to assemble, easy to store in the truck. Comes with heavy duty carry bag so it’s easy to carry

• Handle folds flat for compact storage, extends with new round grip for more comfortable operation and increased power.
Pipe Wrench Handle Extender

Validate and document Ameren design for the pipe wrench handle extenders “visibly bend before the wrench breaks” statement. The benefit of this work is to confirm the safety and efficiency of the handle extenders using high quality and generic aluminum wrenches, and two different alloys for the handle extenders, thereby easing possible concerns about their use. The deliverable is a report and presentation showing the data including the appearance of the tools under heavy loading.
Pipe Wrench Handle Extensions Testing Successful

Aluminum Pipe Wrench is pinned so it won’t slip out
Aluminum bends before wrench breaks – “weak link”
High friction knurled handle provides grip when wet – lowers hand fatigue
Dramatically reduces the force needed to break loose meter nuts – safer and lighter than a cheater bar
For 14” 18” and 24” steel and aluminum wrenches
Original tool designed and tested by a utility – Ameren

New handle design for 36” steel wrench tested up to 700 lbs. of pulling force
Pneumatic Driver/Puller

Develop pneumatic driver and puller for larger probe bars. The benefit of this work is to give an alternative to manual pounding of probe bars into the street, and manual removal of the bars by using existing pneumatic power sources. Depending on the availability of existing devices and the interest of manufacturers, the deliverable is either a functioning piece of hardware or pre-commercial concept prototypes.

The available air pressure and flow to the device is 90 psig and 90 SCFH.

The tool is to be designed to work with a 1” hex bar, should be adaptable to ¾” hex bar.

The probe bar will protrude some minimum inches from the ground when it needs to be removed.

The device can reach over the top of the bar; the bar isn’t attached to a slide hammer or other device.

We may use existing probe bars or have to use a new dedicated probe bar.
Meter Lift Cart

Develop meter lift cart for 1000 cfh meters and other equipment of similar size and weight. The benefits of this work is to provide an ergonomic alternative to the awkward positioning and carrying of large meters by one person or the need to make it a two man job. The deliverable is a prototype that will have the necessary performance characteristics to make it a valid and desirable field tool.

Lift 200 lbs. from ground to 43 inches, fold for small storage, target weight 40 lb., big 8” – 11” wheels for open ground
Integrated Bar Puller

Develop bar puller integrated into slide hammer driver for either a new tool or retrofit existing tools. The benefit of this work is to provide an alternative to pounding a slide hammer probe bar out of the ground thereby improving the ergonomics and reducing fatigue and possible injury. The deliverable is either one or two functioning pieces of hardware or pre-commercial concept prototypes.

The puller will work on a Heath Utility model, either the original or Anglefin.

It will be lightweight and human powered so it can be easily carried by the operator and there shouldn’t be a need to return to the truck to get the tool or a compressed air line.

The tool or parts of it will be attached to the bar driver, probably using this threaded connection.
Insulated Shovel

Develop a non-conductive shovel head to avoid static discharge through PE pipe. The benefit of this work is to avoid static discharge through a PE pipe while excavating with a shovel. Depending on the interest of manufacturers, the deliverable is either a functioning piece of hardware or pre-commercial concept prototypes.

Design is for #2 Round Point with long straight handle
Next Steps

- Continue design, fabrication, and testing of prototypes
- Conduct ergonomic evaluation of Improved Anglefin
- Complete field trials, modify tools as appropriate, deploy and monitor
Presentation is in two parts

1) NYSEARCH Ergonomics Project with several items of interest

2) Other ergonomic tools and applications
   • One other street drill
   • Excavation/restoration
   • Lifting and Loading
Electric hand drills are an accepted option at several utilities, both corded and cordless, for street drilling.

Recent demonstration with a Hilti TE-60 ATC Combi Hammer

Also note the TE-6-A36 cordless
Manual Jackhammers are lighter weight than pneumatic hammer reducing strains and sprains.

- Weighs 25 lbs. compared to 60 lbs.
- Safer than picks and digging bars.
- Excellent for small jackhammer jobs.
- Accepts any standard jackhammer bit.
- Great for exposing valve covers, CP test stations
- At least three manufacturers

BITTYBREAKER™
AJ Utility Hammer 24 lbs. and 16 lbs.

Kravitch Machine Co.
High pressure air excavation tools can help excavation in rocky or porous soils and avoid difficult shoveling.

- Dielectric shaft and handle
- Supersonic nozzle
- Lightweight
- 45 degree nozzle and extensions
Mud and Clay Release Shovels reduce fatigue and strains. Increase productivity.

Mud and clay don’t stick to the “holey” shovel.

New stronger composite handles.
Vibration Tamper for Compaction Isolates Operator with in-line Shock Absorber

Tool acceleration reduced from $30 \text{ or } 40 \text{ m/sec}^2$ down to $10 \text{ m/sec}^2$

European Vibration standards: worker can use tamper with Ergo-Tamp for up to 80 minutes instead of just 8 minutes without it.

Typical Tamper

Tool with Ergo-Tamp

MBW
Lifting and Loading

POWERED HAND TRUCK moves heavy loads up stairs, off truck

Stairs
- Appliances,
- Large Meters
- Regulators

Pick up truck
- Cold Patch,
- Cement

“We recently purchased a Powermate hand truck… What an incredible purchase! Our mechanics love the Powermate, and these material moves are much safer, faster, and easier than before. A senior mechanic even wanted to kiss me after he used our Powermate for the first time… And here's a bonus, it's so easy to work that even a supervisor can use it!"

M.J. Smith, Maintenance Supervisor
Lifting and Loading

Crew Truck
- drills,
- hot tap equipment,
- Jackhammers
- Gas cylinders
- Water pumps

Lift Gate easily loads and unloads heavy equipment off vehicles

Service Vans

Spitz-lift crane system
- Lifting capacity of up to 900 lbs.
- Rotates 360°
- Can mount just about anywhere
- Use one crane with multiple mounts
- Folds up for easy storage
- Lightweight - weighs 30-40 lbs.

Power Mate
Slips Trips and Falls: Gas Meter Carrier

- No threading onto the spuds
- Cap stays on during transport
- Easy to use - good acceptance in the field
- One tool fits most meters
- Balances the load, no awkward carry
Slips Trips and Falls: Gas Meter Carrier

Features:

- Carry Meters Easily
- Comfortable Hand Grip
- Pads won’t Scratch the Paint
- 8” Slot for (175, 225, & 250) &
- 10½” Slot for (425 & 630) Meters
- Holds the Meter in Place During Changes so You don’t have to Kneel or Bend

Valve Cover Lifter
Working on a number of new products…
Thanks!

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