23RD ANNUAL

23RD LCI CONGRESS
OCTOBER 19-22

Reducing Constraint Clouds to See Wisconsin Sunshine–Solar Project Standardized Work

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LEARN BY DOING FROM THOSE WHO DO

WEDNESDAY, OCTOBER 20, 2021

A Story using Standardized Work @ O’Brien Solar Farm

Meeting customer demand

Lean Construction Institute
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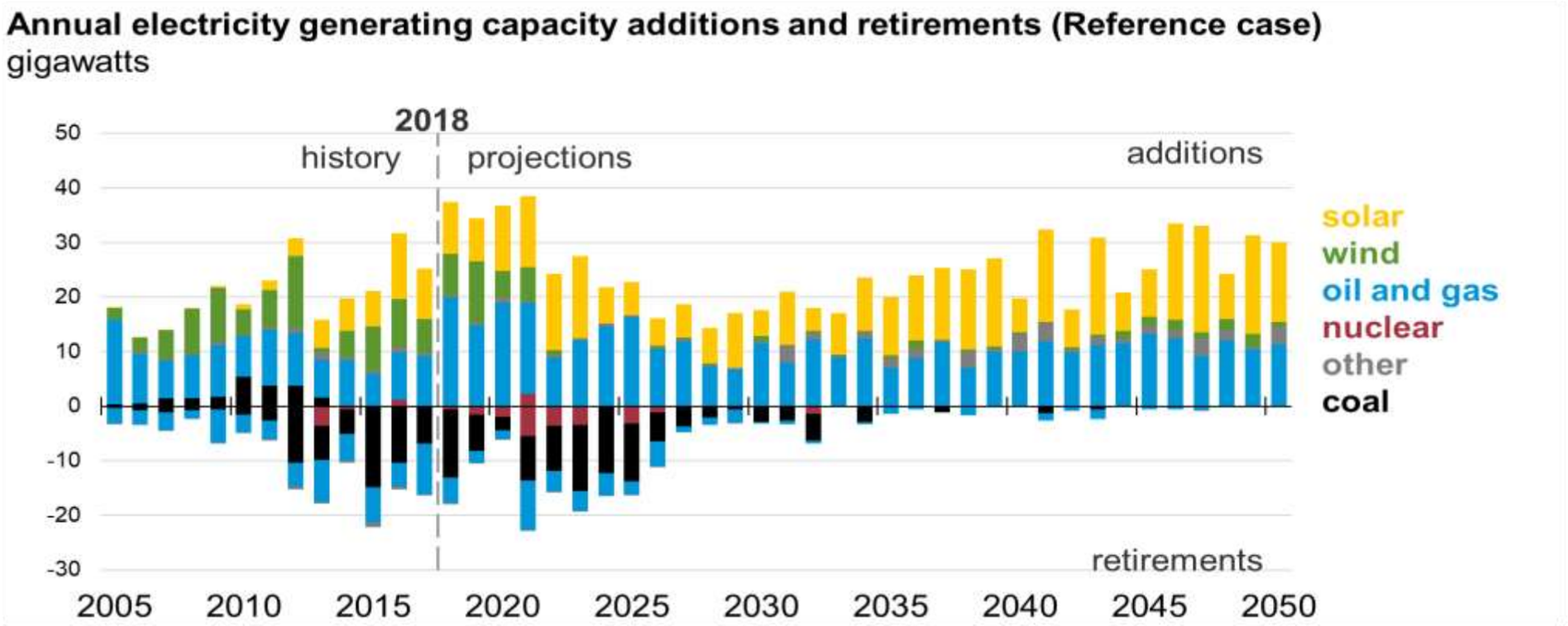
Reason for Action – Serving a growing market

- Wind additions drop dramatically in 2023
- Gas additions drop significantly in 2023, but levelizes thereafter
- Solar and gas additions dominate after 2023
- Coal retirements slow by 2025; most are gone after 2025



Problem Statement

- The Boldt Company was brought onto the project just in time, according to the Developer's schedule. The team had to mobilize quickly and ensure minimal variation solar tracker installation quality.
- The team had to install 103,188 linear feet of trackers in 18 weeks. In terms of an developing an even workflow, that meant installing:
  - 62 complete trackers/week
  - 12.5 complete trackers/day
  - 1.25 complete trackers/hour
- The Boldt team knew the demand outlined above would not be met right away. They needed to make room for ramp up time with the workers.

O’brien Solar Farm

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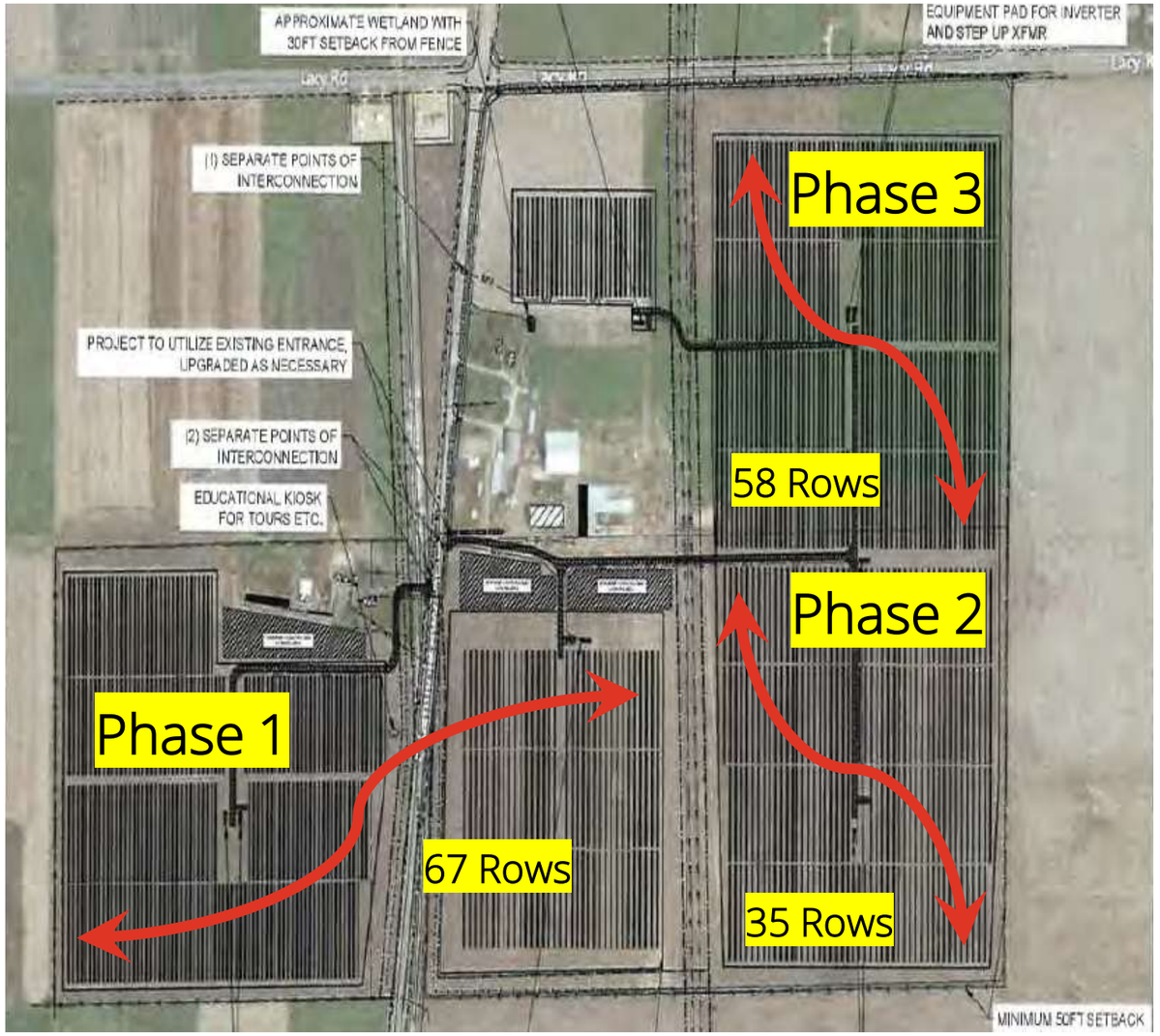
Project Specifics – O’Brien Solar Farm

Developer	**EDF Renewables; DG Group**
Owner and Power Off-taker	Madison Gas & Electric
Size	20,000 kW-ac (24,948 kW-dc)
Interconnect	13.8 kV
Land (163 acres)	Pat and Tom O’Brien leased to MG&E
Modules	62,370 Canadian Solar 400watt, 38.7volt, 10.34amp, 7.0 ft x 3.4 ft, bifacial
Inverters	Eight (8) SMA 690volt central inverters
Racks and Trackers	Soletec single axis trackers

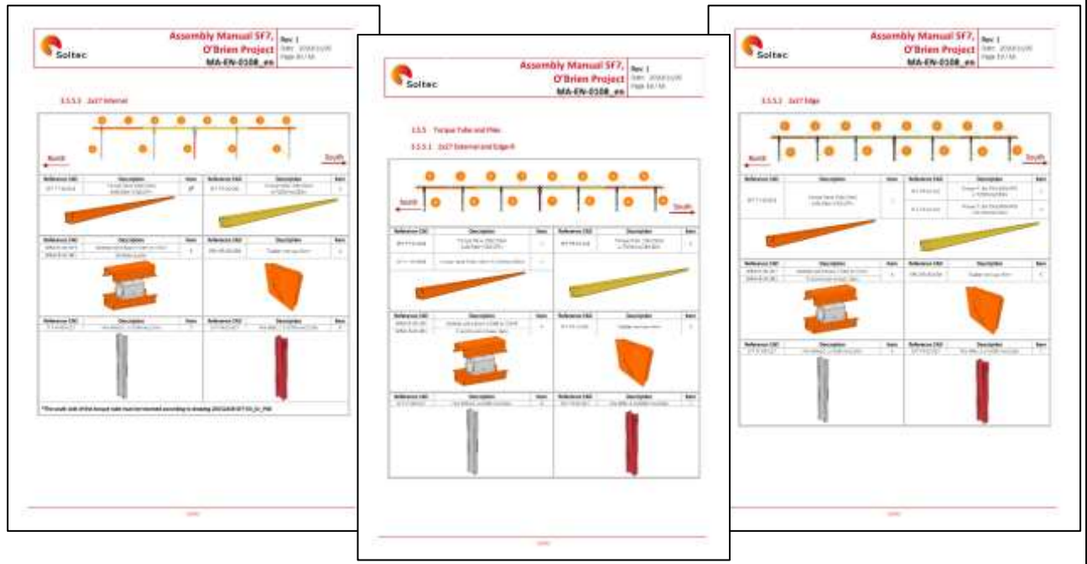
Project Specifics – O'Brien Solar Farm

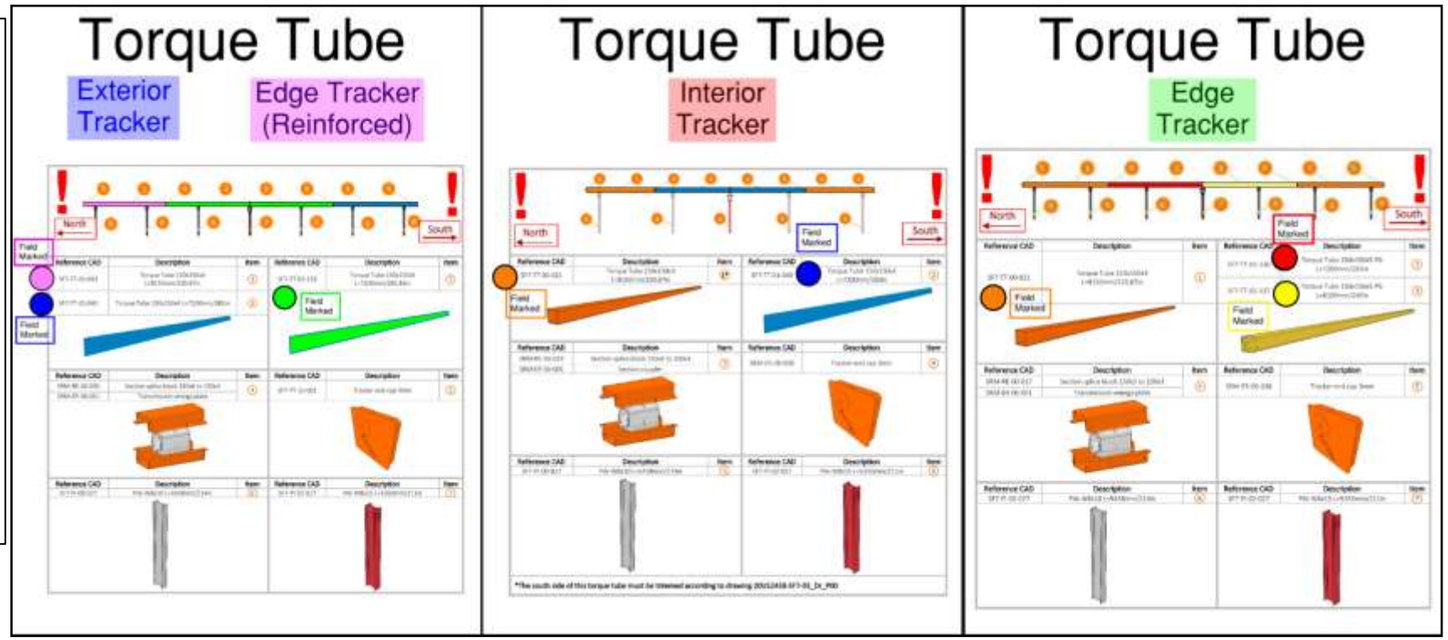
- Driveways, culverts, temporary access roads and laydown areas,
- Storm water and erosion control
- Structural pilings
- Trackers/racking for the solar modules
- Modules install
- Installing DC and AC collection systems - direct buried & above-ground conductor tray spanning row to row; 690v cable run underground to the 13.8kV interconnect
- Combiner boxes, inverters, transformers, and other electrical and monitoring equipment
- Testing and commissioning by MG&E
- Restoration & seeding of site with a low growth pollinator friendly seed mix



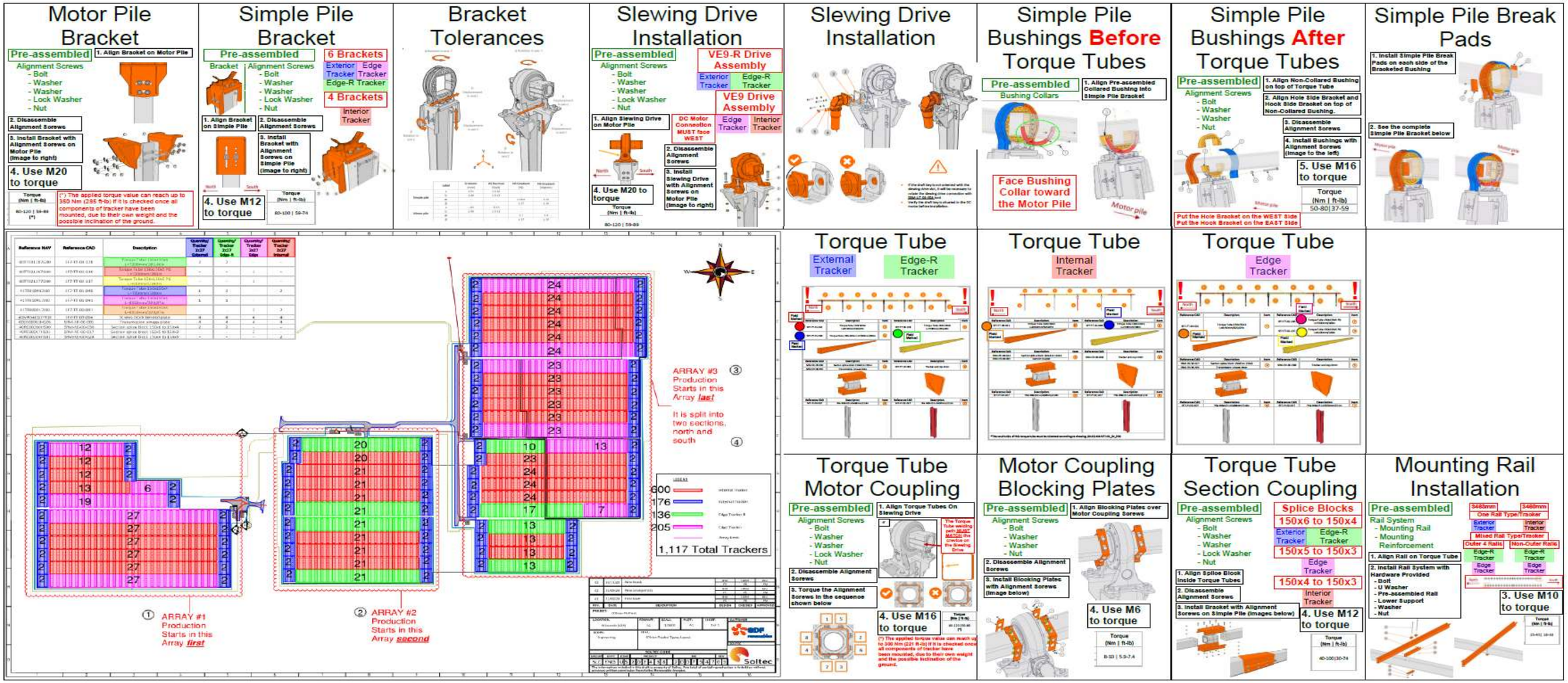
O’Brien Solar Farm - Standardized Work

- Day of award: Arranged training with manufacturer
  - Superintendent
  - Union Rep/Trainer
  - Field Engineer
- Week 2: Standardized work packages
- Week 2/3: Set up prefabrication kits
- Week 3: Mobilize on-site work force





O'Brien Solar Farm - Standardized Work



Pre-Fabrication – improving flow on the job site

- Pre-fabrication area set up beside jobsite
- Workers given ability to layout area to optimize flow
- Standardize work is developed, tested, re-written and then trained

Point of Use Material

- Sequence of steps tested and then repeated to help reduce waste and variation
- Point of Use locations laid out within job site to help reduce movement
- Production tracking measurements evaluated if daily goals were achieved

Learning helped to enhance standardized work

- Teams continued to communicate while working in harsh working conditions
- Real-time feedback loops were created to modify, when needed, standardized work
- Teams were able to realize productivity enhancements driven by pre-fabricated materials

Come on ride the train – Charlie's train

- Using a rapid prototyping mindset, helped to develop Charlie's Train
- Point of Use Assembly Area allowed workers to work at the correct height
- Productivity numbers were improved
- Work back stress was reduced

Focus on Safety

- Teams continued to practice safe working conditions in harsh working conditions

Applying your learning

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How can you apply this tomorrow?

- *Send the project Superintendent, Field Engineer, and Union Hall Instructor to be trained by the manufacturer on the installation specifications so they have a complete understanding of risks and requirements*
- *Get the Field Engineers involved to reduce information down to one sheet, something easy to carry/pin up for the workers in the field*
- *Consolidate information by work type/workstation*

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In the spirit of continuous improvement, we would like to remind you to complete this session's survey! We look forward to receiving your feedback.

Contact Us

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Thank you for attending this presentation. Enjoy the rest of the 23rd Annual LCI Congress!