CONVEYOR EQUIPMENT MANUFACTURERS ASSOCIATION

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2023 CEMA FALL ENGINEERING CONFERENCE
BULK BELT SYSTEMS AND EMERGING TECHNOLOGIES COMMITTEE MEETING
Microsoft Teams Webinar
Monday, November 6, 2023 – 11:15 am

AGENDA

1. Call to order.

2. Attendance and Introductions.

3. Approval of Minutes of June 13, 2023 (Attached).

4. Old business
   a) **Appendix D – Installation Standard** – Updates
   Subcommittee: Todd Swinderman, RToddS Engineering, LLC (chair); Colin Barbeau, Hatch; Jim Masek, PPI; Paul Ormsbee, Overland Conveyor Co. Inc.; Akiko Wakatsuki, Fenner Dunlop Conveyor Belting; Luis Estay, Bechtel Corporation; Laura Hoggan, REMA Tip Top; Todd Hollingsworth, Raw Engineering and Design, LLC.; David Jesse, Lassing Dibben Consulting Engineers Ltd.; Marcus Dos Santos, Dos Santos International.

   The idea is to create two (2) documents:
   - Summary of Installation Tolerances and Startup Procedures – A summary to be included in the CEMA Belt Book, 8th Edition as new Appendix D.
   - CEMA Guide No. 02 "Installation and Startup of Belt Conveyors Handling Bulk Materials" – A separate document that would be an expanded version of Appendix D offered as a technical guide.

   Because the two (2) documents being created are installation standards, it was decided that belt training should be a separate technical paper that needs to be developed after finishing the documents.

   Todd Swinderman will clarify skirtboard and wear liner practices in Appendix D. When the document is complete, it will be sent out to the attendees of this meeting for approval along with the Summary before being sent to the Official Representatives (ORs). He also has some suggestions regarding new knocking idlers' guidance for the committee to review.

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b) **White Paper "CEMA Power Methods"** – Updates
Author: Andrew Jennings, Conveyor Dynamics, Inc.

This white paper is a summary of the history of the CEMA's Power Calculation Methods. Al Reicks, Overland Conveyor Co. Inc., will peer-review the white paper. The white paper has been submitted to the chair of this committee for review and comment.

c) **ARPM Rubber Energy Discussion** – Updates
Subcommittee: Joshua Holcombe, Contitech North America, Inc.; Paul Ormsbee & Al Reicks, Overland Conveyor Co. Inc.; and Andrew Hustrulid, Shaw Almex Industries Ltd.

Robin Steven, Continental North America, Inc. sent to the chairs of this committee a document on a proposed belt energy efficiency standard. It was mentioned that VDI 4459 had produced energy efficiency ranges for conveyors in the 2022 version.

d) **CEMA Belt Book 8th Edition** – Updates
The Board approved, to begin with, the revision of the current chapters of the book and the comments and errata received after the second printing of the book.

Subcommittees were established for those chapters that do not have a specific CEMA committee to review them. The subcommittees are as follows:

- Chapter 1, "Belt Conveyors – General Application and Economics": Akiko Wakatsuki, Fenner Dunlop; Andrew Hustrulid, Shaw Almex Industries Ltd.; Jim Bishop, Rema TIP TOP; and Sergio Zamorano, BEUMER Corporation.
- Chapter 2, "Design Considerations" and Chapter 3, "Characteristics and Conveyability of Bulk Solids": Benjamin Brewer, Douglas Manufacturing Co. Inc.; Michael Riddle, Syntron Material Handling, LLC; Tom Hubbert, Dos Santos International, Todd Hollingsworth, Raw Resources, LLC, and Luis Estay, Bechtel Corporation.
- Chapter 4, "Capacities, Belt Widths, and Speeds": Ryan Cooksley, Universal Industries, Inc.; Marcus Dos Santos, Dos Santos International; Gerhard Schmidt, TAKRAF USA, Inc.; and Sergio Zamorano, BEUMER Corporation.
- Chapter 5, "Belt Conveyor Idlers": **Conveyor Idler Committee**. Benjamin Brewer, Douglas Manufacturing Co., Inc. (Chair); Andrew Hustrulid, Shaw Almex Industries Ltd.; Bob Hawkins, Continental Global Material Handling, LLC; Paul Schmidgall, Superior Industries, Inc.; and Tom Hubbert, Dos Santos International.
- Chapter 6, "Belt Tension and Power Engineering": Al Reicks, Overland Conveyor

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Co. Inc.; Andrew Hustrulid, Shaw Almex Industries Ltd.; Gerhard Schmidt, TAKRAF USA, Inc.; and Andrew Jennings, Conveyor Dynamics, Inc.

- Chapter 7, "Belt Selection": Joshua Holcombe, Contitech North America (Chair), Inc.; Akiko Wakatsuki, Fenner Dunlop; Tamara Thimmel, Behabelt USA.
- Chapter 8, "Pulley Shafts and Bearings": **Conveyor Pulley Committee** Jeff Ellis, PPI (Chair); Andrew Hustrulid, Shaw Almex Industries Ltd.; Bob Hawkins, Continental Global Material Handling, LLC; Travis Faulhaber, Imperial Conveying Systems; and Jonathan Phillips, Dodge Industrial, Inc.
- Chapter 9, "Curves": Al Reicks, Overland Conveyor Co. Inc.; Andrew Hustrulid, Shaw Almex Industries Ltd.; and Gerhard Schmidt, TAKRAF USA, Inc.
- Chapter 10, "Steep Angle Conveying": Sergio Zamorano, BEUMER Corporation; Akiko Wakatsuki, Fenner Dunlop; Marcus Dos Santos, Dos Santos International; Travis Faulhaber, Imperial Conveying Systems; Dan Miners, Cambelt International LLC; and Andrew Jennings, Conveyor Dynamics, Inc.
- Chapter 11, "Belt Cleaners and Accessories": **Conveyor Accessories Committee** Benjamin Brewer, Douglas Manufacturing Co., Inc.; and Andrew Timmerman, Martin Engineering Company.
- Chapter 12, "Transfer Points": Jim Bishop, Rema TIP TOP; Todd Swinderman, RToddS Engineering, LLC; and Bert Erdmann, Martin Engineering Company.
- Chapter 13, "Conveyor Motor Drives and Controls: **Conveyor Controls Committee.**
- Chapter 14, "Operation, Maintenance, and Safety": **Bulk Handling Safety Committee.** Todd Swinderman, RToddS Engineering, LLC (chair); Rick Tschantz, RRT Sales, LLC.; Eric Saffell, Raw Resources, LLC; Scott Adams, Ingenium Design; Andrew Jennings, Conveyor Dynamics, Inc.; Dan Rosseljong, Sumitomo Drive Technologies; and Dan Fannin, Regal Rexnord
- Chapter 15, "Belt Takeups": Benjamin Brewer, Douglas Manufacturing Co., Inc.; Dan Miners, Cambelt International LLC; Ryan Cooksley, Universal Industries, Inc.; and Peter Morzinski, Dodge Industrial, Inc.
- Chapter 16, "Emerging Technologies": Andrew Hustrulid, Shaw Almex Industries Ltd.; Sergio Zamorano, BEUMER Corporation; Gerhard Schmidt, TAKRAF USA, Inc.; Akiko Wakatsuki, Fenner Dunlop; Marcus Dos Santos, Dos Santos International; and Dan Miners, Cambelt International LLC.
- Appendixes A, "Units" and B "Nomenclature": Naylu Garces, CEMA
- Appendix C, "CEMA Historical Method K_x, K_y, and K_t Factors": Same people of Chapter 6.
- Appendix D, "Conveyor Installation Standards for Belt Conveyors Handling Bulk Materials": Todd Swinderman, RToddS Engineering, LLC (chair); Colin Barbeau,

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Hatch; Paul Ormsbee, Overland Conveyor Co. Inc.; Akiko Wakatsuki, Fenner Dunlop Conveyor Belting; Luis Estay, Bechtel Corporation; Todd Hollingsworth, Raw Engineering and Design, LLC.; David Jesse, Lassing Dibben Consulting Engineers Ltd.; Marcus Dos Santos, Dos Santos International.

- Appendix E, "Belt Conveyor Idler Roll A_i' Test Procedure": Same people of Chapter 6.
- Appendix F, "Belt Conveyor Idler Roll K_{is}' Test Procedure": Same people of Chapter 6.

5. New Business

6. Next Meeting – June 11, 2024, Naples Grande Beach Resort, Naples, FL.

7. Adjourn.

Todd Hollingsworth, Chair
Andrew Jennings, Vice Chair

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2023 CEMA ENGINEERING CONFERENCE
BULK BELT SYSTEMS AND EMERGING TECHNOLOGIES COMMITTEE MEETING
Naples Grande Beach Resort, Naples, FL
Tuesday, June 13, 2023

MINUTES

1. Call to order.
   Todd Hollingsworth, Raw Resources, LLC; Chair, called the meeting to order at 2:00 pm.

2. Attendance and Introductions – Roll call attached.

3. Approval of Minutes of November 7, 2022 – Minutes were approved.

4. Old business
   a) **Appendix D – Installation Standard** – Updates
   Subcommittee: Todd Swinderman, RToddS Engineering, LLC (chair); Colin Barbeau, Hatch; Jim Masek, PPI; Paul Ormsbee, Overland Conveyor Co. Inc.; Akiko Wakatsuki, Fenner Dunlop Conveyor Belting; Luis Estay, Bechtel Corporation; Laura Hoggan, REMA Tip Top; Todd Hollingsworth, Raw Engineering and Design, LLC.; David Jesse, Lassing Dibben Consulting Engineers Ltd.; Marcus Dos Santos, Dos Santos International.

   The idea is to create two (2) documents:
   - Summary of Installation Tolerances and Startup Procedures – A summary to be included in the CEMA Belt Book, 8th Edition as new Appendix D.
   - CEMA Guide No. 02 "Installation and Start-Up of Belt Conveyors Handling Bulk Materials" – A separate document that would be an expanded version of Appendix D offered as a technical guide.

   Because the two (2) documents being created are installation standards, it was decided that belt training should be a separate technical paper that needs to be developed after finishing the documents.

   Todd Swinderman will clarify skirtboard and wear liner practices in Appendix D. When the document is complete, it will be sent out to the attendees of this meeting for approval along with the Summary before being sent to the Official Representatives (ORs). He also has some suggestions regarding new knocking idlers' guidance for the committee to review.

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b) **New Content for the CEMA Belt Book, 8th Edition regarding Idler Replacement and Idler Condition Monitoring** (Former topic "Idler Maintenance Safety") – Updates.
Subcommittee: Colin Barbeau, Hatch (chair); Gerhard Schmidt, TAKRAF USA, Inc; Geoff Stoll, Richwood; Jim Masek, PPI; David Jesse, Lassing Dibben Consulting Engineers Ltd; Benjamin Brewer, Douglas Manufacturing Co. Inc.; Erick Jackson, TAKRAF USA, Inc.

A draft was created and includes a weight requirement table for the lifting belt to be added to Chapter 2 of the Belt Book (8th edition). Calculations behind the table need to be reviewed for technical accuracy.

Previously, a review was done of the belt lifting force table. The draft also includes language about idler replacement technology for inclusion in the Belt Book 8th Edition Chapter 16 Emerging Technologies.

The draft was sent to the 2022 CEMA Fall Engineering Conference attendees and the comments and objections received were reviewed. It was agreed to modify the text, so it is clearer that this is an emerging technology. Since it goes in Chapter 16 "Emerging Technologies", the intent is clear.

After the subcommittee makes the changes, it will be added to Chapter 16 for the whole revision of the Chapter.

c) **White Paper "CEMA Power Methods"** – Updates
Author: Andrew Jennings, Conveyor Dynamics, Inc.

This white paper is a summary of the history of the CEMA's Power Calculation Methods. Al Reicks, Overland Conveyor Co. Inc.; will peer-review the white paper. The white paper has been submitted to Todd Hollingsworth for review and comment.

d) **DEM Transfer Chute Design/Analysis**– Updates
Subcommittee: Paul Ormsbee, Overland Conveyor Co. Inc. (chair); Matthew Koca, FLEXCO; Andrew Jennings, Conveyor Dynamics, Inc., Colin Barbeau, Hatch; Geoff Stoll, Richwood; David Kruse, Advanced Conveyor Technologies Inc.

It was agreed to move this out of Chapter 16 "Emerging Technologies" and into Chapter 12 "Transfer Points" for the CEMA Belt Book, 8th Ed. It will be reviewed again when the review of Chapter 12 is performed.

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e) **CWD Factor Case** – Updates
Subcommittee: Paul Ormsbee (chair) & Al Reicks, Overland Conveyor Co. Inc.; Andrew Hustrulid, Shaw Almex Industries, Ltd.; Andrew Jennings, Conveyor Dynamics Inc.

Factor to correlate flat belt test to actual trough belt with non-uniform material load distribution across the belt. Non-standard idler sets need to be included. The subcommittee needs to determine how the process can be simplified.

Also, the subcommittee was working on a set of equations that will expand toward non-standard geometry and needs to determine how the process can be simplified. It will be reviewed again when the review of Chapter 6 is performed.

f) **Pipe Conveyor Stiffness/Aging Fatigue Loss with Lifecycles** – Updates
Subcommittee: Sergio Zamorano, BEUMER Corporation (chair); Joshua Holcombe, Contitech North America, Inc; Luis Estay, Bechtel Corporation; Andrew Jennings, Conveyor Dynamics, Inc.; Paul Ormsbee & Al Reicks, Overland Conveyor Co. Inc.; Akiko Wakatsuki, Fenner Dunlop Americas.

Discussion on the loss of stiffness due to lifecycle fatigue is a large part of wear on pipe conveyors. It brought up the question: how do we quantify this for clients so they can plan replacement/lifetime? It was suggested to look at re-writing the section in the CEMA 7th Ed. Belt Book (for the 8th Ed.).

The discussion of this will be added in Chapter 10 “Steep Angle Conveying” review of the Belt Book 8th Ed. Also, it was motioned, seconded, and approved that Chapter 10 be renamed "Specialty Conveying".

This chapter will include, but not be limited to, pipe conveyors, steep angle (pocket and sandwich) conveyors, air-supported conveyors, etc. The chapter is not intended to discuss calculation methods for these conveying types but rather will discuss what questions and information are needed to properly discuss these types of conveyors with the specialist suppliers.

g) **ARPM Rubber Energy Discussion**
Subcommittee: Joshua Holcombe, Contitech North America, Inc.; Paul Ormsbee & Al Reicks, Overland Conveyor Co. Inc.; and Andrew Hustrulid, Shaw Almex Industries Ltd.

Robin Steven, Continental North America, Inc. sent to the chairs of this committee a document on a proposed belt energy efficiency standard. It was mentioned that VDI 4459 has produced energy efficiency ranges for conveyors in the 2022 version.

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The subcommittee recommended that Robin Steven's document be submitted as a White Paper to the CEMA Marketing and Membership Committee. The committee agreed to send the document for approval to the CEMA Marketing and Membership chairs.

h) **CEMA Belt Book 8th Edition Publication**

Todd Swinderman created a proposal that was presented to the CEMA Board of Directors for discussion at the 2023 CEMA Annual Meeting for review and feedback.

The Board approved, to begin with, the revision of the current chapters of the book and the comments and errata received after the second printing of the book. Subcommittees were established for those chapters that do not have a specific CEMA committee to review them. The subcommittees are as follows:

- Chapter 1 "Belt Conveyors – General Application and Economics": Akiko Wakatsuki, Fenner Dunlop; Andrew Hustrulid, Shaw Almex Industries Ltd.; Jim Bishop, Rema TIP TOP; and Sergio Zamorano, BEUMER Corporation.
- Chapter 2 "Design Considerations" and Chapter 3 "Characteristics and Conveyability of Bulk Solids": Benjamin Brewer, Douglas Manufacturing Co. Inc.; Michael Riddle, Syntron Material Handling, LLC; Tom Hubbert, Dos Santos International, Todd Hollingsworth, Raw Resources, LLC, and Luis Estay, Bechtel Corporation.
- Chapter 4 "Capacities, Belt Widths, and Speeds": Ryan Cooksley, Universal Industries, Inc.; Marcus Dos Santos, Dos Santos International; Gerhard Schmidt, TAKRAF USA, Inc.; and Sergio Zamorano, BEUMER Corporation.
- Chapter 5 "Belt Conveyor Idlers": CEMA Conveyor Idler/Pulley Committees.
- Chapter 6 "Belt Tension and Power Engineering": Al Reicks, Overland Conveyor Co. Inc.; Andrew Hustrulid, Shaw Almex Industries Ltd.; Gerhard Schmidt, TAKRAF USA, Inc.; and Andrew Jennings, Conveyor Dynamics, Inc.
- Chapter 7 "Belt Selection": Joshua Holcombe, Contitech North America (Chair), Inc.; Akiko Wakatsuki, Fenner Dunlop; and Laura Hoggan, Rema TIP TOP.
- Chapter 8 "Pulley Shafts and Bearings": CEMA Conveyor Pulley Committee.
- Chapter 9 "Curves": Al Reicks, Overland Conveyor Co. Inc.; Andrew Hustrulid, Shaw Almex Industries Ltd.; and Gerhard Schmidt, TAKRAF USA, Inc.
- Chapter 10 "Steep Angle Conveying": Sergio Zamorano, BEUMER Corporation; Laura Hoggan, Rema TIP TOP; Akiko Wakatsuki, Fenner Dunlop; Marcus Dos Santos, Dos Santos International; Travis Faulhaber, Imperial Conveying Systems; Dan Miners, Cambelt International LLC; and Andrew Jennings, Conveyor Dynamics, Inc.
- Chapter 11 "Belt Cleaners and Accessories": CEMA Conveyor Accessories

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Committee.

- Chapter 12 "Transfer Points": Jim Bishop, Rema TIP TOP; Todd Swinderman, RToddS Engineering, LLC; and Bert Erdmann, Martin Engineering Company.
- Chapter 13 "Conveyor Motor Drives and Controls: CEMA Conveyor Controls Committee
- Chapter 14 "Operation, Maintenance, and Safety": CEMA Safety Committee
- Chapter 15 "Belt Takeups": Benjamin Brewer, Douglas Manufacturing Co., Inc.; Dan Miners, Cambelt International LLC; Ryan Cooksley, Universal Industries, Inc.; and Peter Morzinski, Dodge Industrial, Inc.
- Chapter 16 "Emerging Technologies": Andrew Hustrulid, Shaw Almex Industries Ltd.; Sergio Zamorano, BEUMER Corporation; Gerhard Schmidt, TAKRAF USA, Inc.; Akiko Wakatsuki, Fenner Dunlop; Marcus Dos Santos, Dos Santos International; and Dan Miners, Cambelt International LLC.
- Appendixes A "Units" and B "Nomenclature": Naylu Garces, CEMA
- Appendix C "CEMA Historical Method K_x, K_y, and K_t Factors": Same people of Chapter 6.
- Appendix D "Conveyor Installation Standards for Belt Conveyors Handling Bulk Materials": Todd Swinderman, RToddS Engineering, LLC (chair); Colin Barbeau, Hatch; Jim Masek, PPI; Paul Ormsbee, Overland Conveyor Co. Inc.; Akiko Wakatsuki, Fenner Dunlop Conveyor Belting; Luis Estay, Bechtel Corporation; Laura Hoggan, REMA Tip Top; Todd Hollingsworth, Raw Engineering and Design, LLC.; David Jesse, Lassing Dibben Consulting Engineers Ltd.; Marcus Dos Santos, Dos Santos International.
- Appendix E "Belt Conveyor Idler Roll A_i' Test Procedure": Same people of Chapter 6.
- Appendix F "Belt Conveyor Idler Roll K_{is}' Test Procedure": Same people of Chapter 6.

Also, the potential new content was discussed, and it was agreed to include some of them in the content of the current chapters as follows:

- Rubber and ceramic lagging friction factors and the applicability of the Euler equation: Chapters 6 and/or 8
- Calculation method for C_{wd}: Chapter 6
- Pipe conveyors calculations: Chapter 10
- Horizontal curve calculations: Chapters 6 and/or 9
- Passive dust control: Chapter 12
- C_{sd}: Chapter 12

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i) **Cleated & Sidewall Belt for Incline Applications**
Subcommittee: Geoff Normanton, Fenner Dunlop (chair); Akiko Wakatsuki, Fenner Dunlop; Laura Hoggan, Rema TIP TOP; Sean Henry &Peter Bradley, Continental Contitech North America, Inc.

It was an idea for the CEMA Belt Book, 8th Edition. The idea is the inclusion of cleated belts in the existing table in the CEMA Belt Book, 7th Edition, Chapter 10. Material properties dependent on caking or sticking/lumping materials, molded vs. cleated (fabricated design), specialty belts; create awareness: consider end-user preference, specific design based on material properties (pocket-cleated-molded, maintenance-cleaning, etc.).

The subcommittee finished working on adding illustrations of the different cleat profiles, identifying, and providing a common name for the standard cleat patterns. This content will be included in the Chapter 10 review.

5. New Business – No new business at this time.

6. Next Meeting – November 6, 2023, Virtual CEMA Fall Engineering Conference.

7. The meeting was adjourned at 3:20 pm.

Todd Hollingsworth, Chair