## Overhead Transmission (P35)

The program offers a portfolio of tools and information focused on overhead transmission components and system issues. Key drivers of research include reduced operation and maintenance costs, extending asset life, improved reliability and resiliency, and improved safety.

**Rachel Moore,** Program/ Area Manager, ramoore@epri.com

| PROJECT | 2025 Accomplishments & Key Deliverables | 2026 Plan |
|---|---|---|
| **P35.001** Inspection and Assessment<br><br>Fabien Besnard fbesnard@epri.com | - Co-hosted a workshop on robotics, drones, and imagery uses for transmission and distribution<br>- Reviewed existing applications of LiDAR that could be applicable to transmission assets<br><br>***3002032692*** *LiDAR Applications for Transmission Systems, Review of Existing Practices* | - Host an inspection and assessment workshop<br>- Produce a new web app for Inspection and Assessment Field Guides<br>- Evaluate potential use of distribution inspection technologies to transmission assets |
| **P35.002** Conductor, Shield Wire, and Hardware Corrosion<br><br>Fabien Besnard fbesnard@epri.com | - First version of the ACRS & ACSS conductor corrosion calculator web app available on www.transmission.epri.com<br>- Develop a framework for the evaluation of shield wire corrosion resistance<br><br>***3002022686*** *Shield Wire Corrosion; An Industry Review* | - Update and optimize the ACSR & ACSS conductor corrosion calculator<br>- Corrosion resistant evaluation of different aluminum alloys<br>- Publish a new chapter on the corrosion reference book regarding atmospheric corrosion and conductor corrosion |
| **P35.003** Structure and Sub-Grade Corrosion<br><br>Neal Murray nmurray@epri.com | - Evaluated six new/emerging coating formulations and developed a Coating Selection and Application WebApp available on www.transmission.epri.com<br>- Developed a new technique of measuring stray currents on a transmission structure<br><br>***3002029561*** *Fleet Management of Overhead Transmission Line Structures and Foundations* | -Develop a Cathodic Protection Design and Installation Webapp<br>-Develop recommended practices for evaluation of rights of way encroachment requests for corrosion impacts<br>-Evaluate additional conductive concrete backfill formulations |
| **P35.004** Traditional Conductors and Connectors<br><br>Rachel Moore ramoore@epri.com | - Continued accelerated aging evaluation of joint compound application<br>- Performed field demonstration of temperature probe<br><br>***3002032740*** *Effects of Connector Compound Application in Overhead Transmission Compression Connector Performance* | - Evaluate performance of different t-tap designs<br>- Continue accelerated aging for evaluation of joint compound<br>- Initiate evaluation of new single-stage connectors |
| **P35.005** Ductile Iron and Composite Structures<br><br>David Folk dfolk@epri.com | -Completed cantilever bending tests on 10 ductile iron poles<br>-Developed a composite structures basics course<br>-Evaluated ductile iron pole coating systems<br><br>***3002032744*** *Ductile Iron Utility Poles Application Guide: 2025 Update - Cantilever Bending Tests and Coating Evaluation* | -Develop guidance on accounting for fiber-reinforced polymer (FRP) degradation<br>-Provide cost comparisons for different pole types across voltage levels<br>- Create a ductile iron transmission structure basics training |

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| **P35.006** Lightning Performance and Grounding<br><br>Camille Le Mauff clemauff@epri.com | -Benchmarked different methods to survey soil resistivity<br>-Developed online ground flash density map for continental US<br><br>***3002032754*** *Acquisition of a High Daily Volume of Soil Electrical Resistivity Data: Comparison of Electrical and Electromagnetic Methods* | -Develop and apply a method to use LiDAR data to estimate the shielding failure performance<br>-Evaluate the use of ground penetrating radar to assess existing buried electrodes<br>-Host in-person workshop on grounding for transmission lines |
| **P35.007** Line Design<br><br>Jean-Pierre Marais jmarais@epri.com | - Completed experimentation to confirm efficacy of anti-bolt loosening systems<br>- Performed testing to validate spacer interval to prevent clashing on horizontal conductor bundles<br>- Improved the Optimal Line Tension Calculator.<br><br>***3002033298*** *Optimal Line Tension Calculator, Op10 v2.6* | - Develop Best Practices for LiDAR data in Overhead Line Design<br>- Provide Training Workshop on Lattice Tower Design<br>- Produce a NESC Clearances Calculator<br>- Update Red Book chapter on Inspection and Maintainability |
| **P35.008** Line Resiliency<br><br>Jean-Pierre Marais jmarais@epri.com | - Completed algorithm to predict broken wire load<br>- Host longitudinal failure event loading workshop.<br>- Quantify impact of soil boring on design quality and reliability<br><br>***3002032767*** *Practical Determination of Dynamic Load Impact Factors: 2025 Edition* | -Commence testing on transverse cascade test line<br>- Produce electrical reliability guideline : Design for Asynchronous Conductor Movement<br>- Host a workshop on design for extreme environments |
| **P35.010** Live Working<br><br>Alessandro Berredo aberredo@epri.com | -Completed evaluation of conductive suits and rope field testers.<br>-Conducted UV aging tests jackets and assessed moisture ingress in thermoplastic jacketed ropes.<br>-Performed exploratory testing on ropes for stringing operations<br><br>***3002032774*** *Evaluation of Conductive Suits for Live Line Work* | -Host workshop on temporary protective grounding<br>-Evaluate handheld field insulating stick testers<br>-Continue exploratory tests on contaminated insulating sticks<br>-Investigate performance of ropes subjected to fall arrest of dynamic loads. |
| **P35.011** Polymer and Composite Insulators<br><br>Tim Shaw tshaw@epri.com | - Evaluated the effect of corona ring orientation on the electric field<br>- Mechanically tested and dissected insulators removed from the full-scale aging chamber<br>- Completed evaluation of mechanical impact on polymer insulators<br><br>***3002032782*** *Revision of the Methodology for Assessing Impact Damage on Polymer Insulators* | - Increase sampling size for weathershed bonding tests<br>- Refine steep front impulse testing of polymer insulators<br>- Add new insulators to the aging chamber<br>- Restart the small-scale corona cage with added rain system |

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| **P35.012** Porcelain and Glass Insulators<br><br>Tim Shaw tshaw@epri.com | - Complete initial analysis of broken glass insulator fracture patterns<br>- Validated the apparent salt deposit density (ASDD) tool measurements<br>- Completed initial tests of glass RTV with 500 psi pressure washing<br><br>***3002032785*** *Studying Glass Insulator Failures and Break Patterns* | - Steep impulse test glass insulators<br>- Collect and analyze hardware alignment data<br>- Advance ASDD tool development<br>-Continue development of RTV coating performance methodologies<br>-Commission new mechanical/electrical tester |
| **P35.013** Line Ratings and Increased Power Flow<br><br>Justin Bell jbell@epri.com | -Documented member provided uprating projects including reconductoring, voltage upgrades, GETS, etc. for peer benchmarking and trend analysis<br>-Developed two guides for DLR covering cybersecurity and technology selection<br>-Added TRC calculators for cost planning, project planning, and tracking new DLR technologies<br><br>***3002032788*** *Technical Review of Methods Used to Determine Dynamic Line Ratings (DLR)* | -Provide best-practices for piloting DLR leveraging past successes and failures<br>-Develop guidance for extreme congestion cases resulting from datacenters/AI<br>-Provide information on interactions between uprating and EMF compliance<br>-Transition ETI/ATI database to the TRC with results from new samples<br>-Add more rating calculators to the TRC |
| **P35.014** High Temperature Operations<br><br>Rachel Moore ramoore@epri.com | -Continued annealing study for copper conductors<br>-Added HTC Matrix Calculator to www.Transmission.EPRI.com<br>-Initiated high temperature corrosion testing<br><br>***3002032798*** *Corrosion of ACSR Conductors at High Temperature* | -Continue annealing studies on copper and aluminum alloys<br>-Add more HTC Matrix Calculators to web<br>-Evaluate field applied high emissivity coatings<br>-Continue high temperature conductor corrosion study |
| **P35.015** Advanced Conductors and Connectors<br><br>Gary Sibilant gsibilant@epri.com | -Completed initial Fire Exposure testing on steel core and carbon core conductors.<br>-Completed new qualification test on TS conductor @ 200C.<br>- Published first version of report detail HTLS Installation Tests and Maintenance needs<br><br>***3002032803*** *Fire Exposure Testing* | -Evaluate the effects of dynamic load events on advanced conductors<br>-Determine the effects of high temperature on maintenance tools and the effect of tools on high temperature conductors<br>-Initiate qualification tests on an EPSILON Carbon core conductor |

**Program 35**

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| **P35.018**<br>Line Switches<br><br>Alessandro Berredo<br>aberredo@epri.com | -Conducted exploratory tests to measure whip speed through high-speed camera.<br>-Developed endurance testing rig for switch components.<br>-Conducted forensic investigation in solid insulation 230 kV vacuum interrupters, and inspection in contacts of center-break 230 kV switch.<br><br>***3002032806*** *Inspection and Maintenance of Transmission Line Switches* | -Perform arc extinguishing testing on different whips<br>-Perform mechanical endurance of whips<br>-Continue exploratory whip speed tests.<br>-Perform initial environmental tests on bearing assemblies.<br>-Perform and document forensic investigation on three-way RCMOS. |
| **P35.019**<br>HVDC Lines<br><br>Gary Sibilant<br>gsibiliant@epri.com | -Published report detailing existing HVDC Line Parameters and Testing Facility<br>-Updated the HVDC Line Design Guide with information on using Anomalous Flashovers<br><br>***3002032812*** *HVDC Line Parameters and Testing Guide* | -New report on Anomalous Flashovers – updating performance improvements due to design changes<br>-Update HVDC Line parameters and testing report<br>-Publish report on ground electrode and electrode line design, maintenance and refurbishment |

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