April 9, 2021

Wildfire Safety Advisory Board – Request for Public Input & Response

RE: Draft Recommendations on the 2021 Wildfire Mitigation Plan (WMP) Updates for Large Investor-Owned Utilities (IOU)

RS Technologies Inc. – Input & Response

- **About RS Technologies Inc**. – RS is a manufacturer of Fiber Reinforced Polymer (FRP) composite utility structures, including Transmission & Distribution poles and composite Fire Shields for use on both wood and composite poles. Since 2003, RS has supplied modular FRP composite poles to the electric utility and communications industries.
- **Wildfire Testing** – In 2011, RS undertook an important mission to develop and establish full-scale wildfire test methods for utility poles and provide the utility industry with verifiable test and research data on the performance of RS Composite Poles under wildfire conditions (FR Poles – Fire Resistant Poles). Over the past ten years RS has led the industry to a now-accepted test protocol that has been adopted or adapted by several western utilities.
    - RS continues to lead industry research with the development of the RS Wildfire Data Logger. This device is designed to be deployed in the path of an active wildfire to record the specific characteristics unique to each placement location. RS supports the dissemination of this data for the improvement of testing criteria and wildfire response training.
- **Application – RS** has supplied over 10,000 FRP Composite Poles to Southern California Edison for use in High Fire Threat Areas (HFTA), and has supplied composite poles to SDGE, LADWP, PG&E and PacifiCorps for deployment in a wide variety of applications including wildfire exposure areas. FRP composite poles play a key role in the Southern California Edison's Annual Update to 2020-2022 Wildfire Mitigation Plan.
- **Grid Hardening –** The RS FRP Composite Pole plays a key role in Grid Hardening initiatives to meet Wildfire Planning requirements. With its ability to maintain structural integrity during a fire event, critical power circuits remain powered and available to support fire suppression efforts, maintain municipal and individual water supply infrastructure, and facilitate fire evacuation (traffic signals, roadway lighting and residential lighting are all are critical to both daytime and nighttime evacuations).
    - Proven to survive in both testing and actual wildfire events (2020 Apple & Lake fires) the RS FRP Composite Poles eliminate the need for immediate sourcing and replacement of poles and downed power circuits as experienced with traditional wood poles. The high survival rate (100% so far) enables grid operators to accelerate grid restoration, which in turn, accelerates physical and economic recovery and minimizes strain on citizens, social networks, and the local economy.
- **Recommended Use –** RS recommends the use of RS FRP Composite poles in the following Transmission, Substation & Distribution applications:
    - All HFRA areas (Tier 1-3) as wildfires are notably uncontrollable and regardless of source can quickly expand into adjacent areas regardless of HFRA classification level.

- All poles supporting pole mounted equipment. Pole mounted utility equipment supports grid switching, regulation and communications critical to effective grid operation during both normal and wildfire events.
- Substation Entry/Exit structures as these are typically heavier structures and key to quickly restoring power to/from substations.
- Installations in areas where vehicle impact risk is high.
  - The light weight of the RS pole will not drag the circuit lines to the ground as the circuit conductor tension will typically support the pole weight.
  - The RS pole is hollow and will typically absorb or deflect the vehicle impact reducing the impact severity to the vehicle occupants.
  - If the impact severity does not shear the pole, the remaining fiber will support the pole in place minimizing or eliminating surrounding damage and potentially maintaining circuit integrity.

- **Supply Chain Improvements –** The sharp increase in demand for RS FRP Composite Poles for wildfire applications is driven by the success of the pole in wildfire events. In response, RS has invested over $40MM in new production facilities strategically located in SW Utah which will provide an increased supply of poles beginning 4Q-2021.
- **Industry Leadership –** RS Technologies Inc. participates in domestic and international Utility industry organizations to aggressively support education and standards development through active roles of service and leadership. Organizations include:
  - IEEE, CEATI, EPRI, CEA, ACMA, NRECA, CIGRE, ANSI & NESC to name a few.
  - RS is willing and available to present technical wildfire research information and product test data to the WASB upon request.

RS FRP Composite Pole – Grid Hardening & Wildfire Benefits

- Wildfire Mitigation Planning – Grid Hardening Strategies
  - The utility pole plays one of the key roles in supporting grid integrity. Ideally, the pole must support conductors and equipment while remaining in service with 100% Resiliency and 100% Reliability throughout a wide variety of climate conditions.
  - No Ignition Capability – The RS Pole is non-conductive and will not contribute to wildfire ignition.
  - Proven Technology
    - The RS FRP Composite Pole while in service since 2003, has recently been successfully deployed throughout California by SDGE, LADWP, PG&E and PacifiCorp for deployment in a wide variety of applications including wildfire exposure areas.
  - Risk Reduction
    - The use of RS FRP Composite Poles significantly reduces or altogether eliminates utility structures as a source of wildfire ignition.
    - Operational failure risk is also significantly reduced or eliminated.
  - Vegetation Management

        - RS recognizes the challenges of timely Vegetation Management. Invasive grasses can quickly encroach within the RoW impacting the Utility Defensible Space (UDS). The fire resistance of the RS FRP Composite Pole reduces the risk of wildfire damage due to increased flashy fuels within utility RoW areas. This risk buffer can be instrumental as wildfire seasons are increasing in length thereby minimizing timeframes of achieving Vegetation Management goals.
- Wildlife Non-Climbable - The smooth surface of the RS Composite Pole eliminates wildlife climbing or landing on the pole. This feature alone has the potential to reduce or eliminate wildlife related outages and ignition events.
- Workforce Safety - Non-Conductive – The RS Pole has been electrically tested and while not listed as "Non-Conductive" (Listing requires extensive/expensive annual maintenance & testing) the test criteria indicate the pole is safer than hot line equipment (Hot Sticks) used for handling energized high voltage power conductors.
    - RS Pole Non-Conductivity also minimizes or eliminates wildlife arcing between energized conductors and the pole when wildlife is within the pole top/conductor area.
        - Wood, steel, and ductile iron poles exhibit this risk factor.
    - Increase lineworker safety – Distribution circuits and increasingly, Transmission circuits are maintained energized or "hot". The non-conductive RS FRP Composite Pole provides line workers an additional level of safety in the event of accidental/incidental energized contact.
        - Wood, steel, and ductile iron poles exhibit this risk factor.
    - Public Safety is also improved in the unlikely event a conductor comes in contact with the pole.
        - Wood, steel, and ductile iron poles exhibit this risk factor.
- Workforce Safety – Climbing
    - When bucket truck access is limited, the RS Pole is safely climbed using pole steps with fall-arrest attachment loops.
- Safety – Remote/Difficult Access Installations
    - When bucket truck access is limited, the modular RS Composite Pole can be moved in lightweight sections (<20' in length; individual module weights range from 150 – 360 lbs.).
    - The RS Gin Pole allows for manual, vertical pole assembly/installation increasing lineworker safety and minimizing environmental impact of the installation process.
    - The light weight of the RS Pole also allows for lightweight helicopter lifts for pole installation in remote or difficult to access areas.
- Environmental – The non-leaching, inert RS FRP Composite Pole passes drinking water standards and can be safely installed in watershed or environmentally sensitive areas with no risk of contamination.
- High Strength – The RS Pole is an engineered structure that consistently exceeds industry strength standards. This high-strength capability is especially critical when supporting heavier covered conductor circuits often deployed in HFRA zones.
- Reserve Overload Capacity – The RS Pole can absorb overload conditions without breaking (tree falling on line conductors increasing pole loading). This reserve capacity can maintain line

integrity in changing weather and loading conditions ensuring the power structures are not damaged.

- Hydrophobic/Self-Cleaning – The RS Pole exhibits high hydrophobicity (high levels of surface tension thereby resisting water) characteristics. This minimizes the pole surface contamination levels as dirt/dust/debris/salts have difficulty sticking to the pole surface. Pole surface debris support electric arcing/tracking which may develop as a source of wildfire ignition. The RS Pole surface is easily cleaned of any incidental surface debris through naturally occurring wind and rain events due to low adhesion levels.
- Maintenance – No scheduled maintenance is required to achieve full pole life performance.
- CAPEX vs. OPEX Benefits
    - CAPEX – Investment in RS Poles is capitalized as a long-term investment (80+ year life) and will carry a significant negative depreciation through to asset retirement.
        - While the initial pole material investment in RS FRP Poles is approximately 2X Wood FR poles, this cost is an incremental addition to the installed cost and is quickly recouped through the elimination of regular O&M costs, extensive inspection.
    - Risk Spend Efficiency – The integration of RS Poles in WMP strategies provides an efficient use of CAPEX funds as the RS Pole significantly reduces wildfire ignition and structure failure risk. The costs to deploy the RS Pole nominal as it is easily adopted into existing work methods.
        - The Risk Spend Efficiency is significantly magnified as the RS Pole 80+ year asset life is 2x-3x traditional pole materials.
    - OPEX (O&M) to maintain the pole in operation is significantly reduced as the RS FRP Composite Pole requires no scheduled maintenance to achieve full asset life.
        - Inspection and asset tracking costs drop in comparison to the remainder of the traditional pole fleet (wood/steel/concrete) as the RS FRP Pole is simply visually inspected for physical damage (impact/pole damage).
        - Operational Inspection Risk is eliminated as the human error “interpretation” of decay/corrosion damage is non-existent.
- Decision-Making Based on Modeling Outcomes
    - RS Poles provide predictable engineered structure performance. Modeling Outcome accuracy increases as model inputs are based on narrow performance-based parameters based on field results and extensive laboratory testing.
- Workforce Training
    - RS has published documentation for each step required for the structure design (GO95 compliant), installation, post-fire event testing and remediation of poles in HFRA’s.
- Qualified Electrical Workers – In light of the tight labor force the deployment of the RS Pole minimizes the need for QEW’s to perform all tasks and reduces long-term O&M labor requirements.
    - Inspections – Addressed earlier, simple inspection for physical damage minimizes training requirements and reduces human error when interpreting pole condition.

    - Maintenance – No scheduled maintenance is required for the RS Pole to achieve the projected 80-year service life.
    - Elimination of the Test & Treat program for RS poles.
        - Elimination of adding chemicals for minimizing/slowing wood pole decay.
- Ratepayer Benefits
    - QEW allocations may be reassigned from pole maintenance roles categorized as Expense to more strategic or revenue generating roles.
    - Reassignment of QEW's from pole maintenance may result in lower rates due to lower direct maintenance Expense costs.
- Stakeholder Cooperation & Community Engagement
    - RS supports broad stakeholder involvement in evaluating the RS FRP Composite pole benefits & risk factors when compared to other FR pole options (FR Wood, Steel, Ductile Iron & Concrete)

RS Technologies Inc. appreciates the opportunity to submit input to the WASB. Should any questions arise, please contact:

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