vesprsolar

The Piranha System: Technical Assistance Request

1. Technical Assistance: Development of wind performance analysis and design optimization

   - **Unique Challenge:** Structural performance for PV module clamps that do not rely on bolts may be compromised under severe wind conditions, particularly turbulent wind gusts. Combinations of uplift and vibration may lead to displacement of clamps and modules, and eventually structural failure.

   - **Technical resources needed:** Advanced modeling capabilities, involving computational fluid dynamics and wind tunnel testing, are required to understand and mitigate such risk.

2. Technical Assistance: Metal fatigue analysis and design optimization

   - **Unique Challenge:** Fasteners relying on spring-based mechanisms may be subject to metal fatigue over time due to cycling loading. Specific experimental models are required to better understand and avoid failure modes associated with this phenomenon.

   - **Technical resources needed:** Expertise in analysis and design of steel structures under fatigue.

3. Technical Assistance: Sheet-metal manufacturing / progressive stamping

   - **Unique Challenge:** Our current sheet-metal prototypes have been fabricated manually, relying on heat treatment to achieve required levels of hardness (~RH40). In real production however, heat treatment would likely increase manufacturing cost unnecessarily, and therefore should be avoided in favor of work-hardening during progressive stamping process itself.

   - **Technical resources needed:** Expertise in progressive stamping, including material selection, tooling (stamping dies, stations, etc.), galvanization and deburring, to ensure required levels of performance at lowest cost possible.

4. Technical Assistance: Support for UL2703 certification / validation from PV module vendors

   - **Unique Challenge:** UL certification is an expensive, lengthy process. On the other hand, racking providers rely not only in certification for the adoption of fastening solutions, but also validation from PV module vendors, who provide lists of approved products and methods that do not violate modules' warranties. The path towards this type of approval / validation is not clear, and we seek support to better understand and succeed in this effort, which would also help us to achieve UL2703 certification.

   - **Technical resources needed:** Access to PV module vendors, roadmap to validation.