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Wed-Mo-Or3-03: Progress in production scale-up and enhancement of in-field properties with PLD at SuNAM

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SuNAM has long been at the forefront of coated conductor (CC) technology, leveraging its proprietary Reactive Co-evaporation-Deposition and Reaction (RCE-DR) process to meet diverse industry needs, particularly in grid applications. However, the emergence of compact fusion reactors has presented unprecedented challenges, demanding in-field critical current performance that surpasses the capabilities of our enhanced RCE-DR process, even with integrated pinning centers.

To overcome these limitations, we have strategically pivoted to Pulsed Laser Deposition (PLD) technology. Our team is in the final stages of optimizing this system for mass production of fusion-grade CCs. This presentation will provide insights into our comprehensive optimization process, detailing our analysis of electrical characteristics, microstructural properties, and the intricate interplay of various deposition parameters.

Furthermore, we will showcase our parallel efforts in cost reduction strategies, including the development of wider-web processing techniques and the implementation of machine learning algorithms for process automation. These advancements aim to ensure that our high-performance CCs remain economically viable for large-scale fusion projects.

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