Abstract Submitted
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Establishing Physical and Engineering Science Base to Bridge from ITER to Demo Y.-K. MARTIN PENG, ORNL. UT-Battelle, M. ABDOU, UCLA, D. GATES, PPPL, C. HEGNA, U Wisconsin, D. HILL, LLNL, F. NAJMABADI, UCSD, G. NAVRATIL, R. PARKER, MIT, NCT DISCUSSION GROUP COLLABORATION — A Nuclear Component Testing (NCT) Discussion Group emerged recently to clarify how "***a lowered-risk, reduced-cost approach can provide a progressive fusion environment beyond the ITER level to explore, discover, and help establish the remaining, critically needed physical and engineering sciences knowledge base for Demo.***" The group, assuming success of ITER and other contemporary projects, identified critical "gap-filling" investigations: plasma startup, tritium self-sufficiency, plasma facing surface performance and maintainability, first wall/blanket/divertor materials defect control and lifetime management, and remote handling. Only standard or spherical tokamak plasma conditions below the advanced regime are assumed to lower the anticipated physics risk to continuous operation ($\sim$2 weeks). Modular designs and remote handling capabilities are included to mitigate the risk of component failure and ease replacement. Aspect ratio should be varied to lower the cost, accounting for the contending physics risks and the near-term R&D. Cost and time-effective staging from H-H, D-D, to D-T will also be considered. *Work supported by USDOE.

Y.-K. Martin Peng
ORNL. UT-Battelle

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