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**Physics Optimization of the ARIES-RS Fusion Power Plant**<sup>1</sup> V.S. CHAN, M.S. CHU, C.M. GREENFIELD, R.J. LA HAYE, L.L. LAO, Y.R. LIN-LIU, M.A. MAHDAVI, C.C. PETTY, P.A. POLITZER, R. PRATER, H.E. ST. JOHN, G.M. STAEBLER, E.D. STAMBAUGH, A.D. TURNBULL, W.P. WEST, General Atomics, J.E. KINSEY, Lehigh University, T.K. MAU, University of California, San Diego — The 1996 ARIES-RS physics design is being revisited with the goal of further optimization in the following areas: (1) A fully-aligned bootstrap current at the plasma edge to eliminate the need for edge non-inductive current drive, (2) Refinement of the beta-limit calculation to include intermediate n ideal modes, resistive wall and non-ideal effects, (3) Use of physics-based transport model for internal transport barrier (ITB) formation, (4) Comparison of current drive and rotational flow drive using fast wave, electron cyclotron waves and negative ion beam, and (5) Further improvements in heat and particle control. Integrated modeling of the optimized scenario will be performed to study the robustness of the bootstrap alignment, ITB sustainment, and stable ramp-up path to high beta and high bootstrap fraction current operation.

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