Summary

A life support system for a 25-person crew based on controlled agriculture, designed for long-duration spaceflight or isolated terrestrial installations. The system prioritizes predictability and redundancy over theoretical efficiency, using rice cultivation as the primary oxygen generation engine and implementing comprehensive materials cycling to minimize resupply requirements.

Key Innovation: Dual-purpose rice cylinders (oxygen generation + caloric yield) operated out-of-phase for steady gas exchange, combined with a "boring = safe" philosophy that favors proven techniques over optimization.

Status: Complete conceptual design with mass/energy budgets, crop schedules, and failure mode analysis.