11. Recommendations

11.1 Required Actions

> ### Critical Action Items
>
> 1. **Conduct RSET Analysis:** Complete evacuation modeling to calculate required egress time and compare with ASET
> 2. **Verify Safety Margin:** Ensure ASET - RSET $\geq$ 1.5 $\times$ RSET (minimum 50% margin)
> 3. **Evaluate Design Options:** If safety margin is insufficient, consider fire protection enhancements or egress improvements
> 4. **Sensitivity Analysis:** Test variations in fire location, HRR, and ventilation conditions

11.2 Model Refinement Opportunities

- **Grid refinement:** Perform mesh sensitivity study to ensure grid-independent results ($D^*/\delta x \geq 10$ recommended)
- **Multiple exit points:** Analyze ASET at all critical exit locations, not just a single point
- **Transient occupancy:** Consider ASET along egress paths, not just final exit locations
- **Detector activation:** Include smoke detector response to account for alarm delay in RSET

11.3 Documentation Requirements

For regulatory approval and peer review, the following documentation should be prepared:

- Complete FDS input file with annotated parameter selections
- Justification for design fire scenarios (HRR, location, fuel properties)
- Grid resolution verification study
- RSET analysis report with evacuation simulation results
- Safety margin calculation and sensitivity analysis
- Comparison with prescriptive code requirements