

# AGENCY DECAY: SIMULATION REPORT

## A MONTE CARLO ANALYSIS OF SAFETY-CRITICAL AUTOMATION

We executed a Monte Carlo simulation ( $n=1,000$  shift cycles) to quantify the impact of 'Passive Monitoring' on system safety. The data reveals a critical divergence: While fully automated systems reduce short-term overhead, the exponential decay of human operator vigilance creates a 'Risk Delta' that rises sharply after hour 3. This report proposes a 'Grounded Architecture' to flatten this curve.

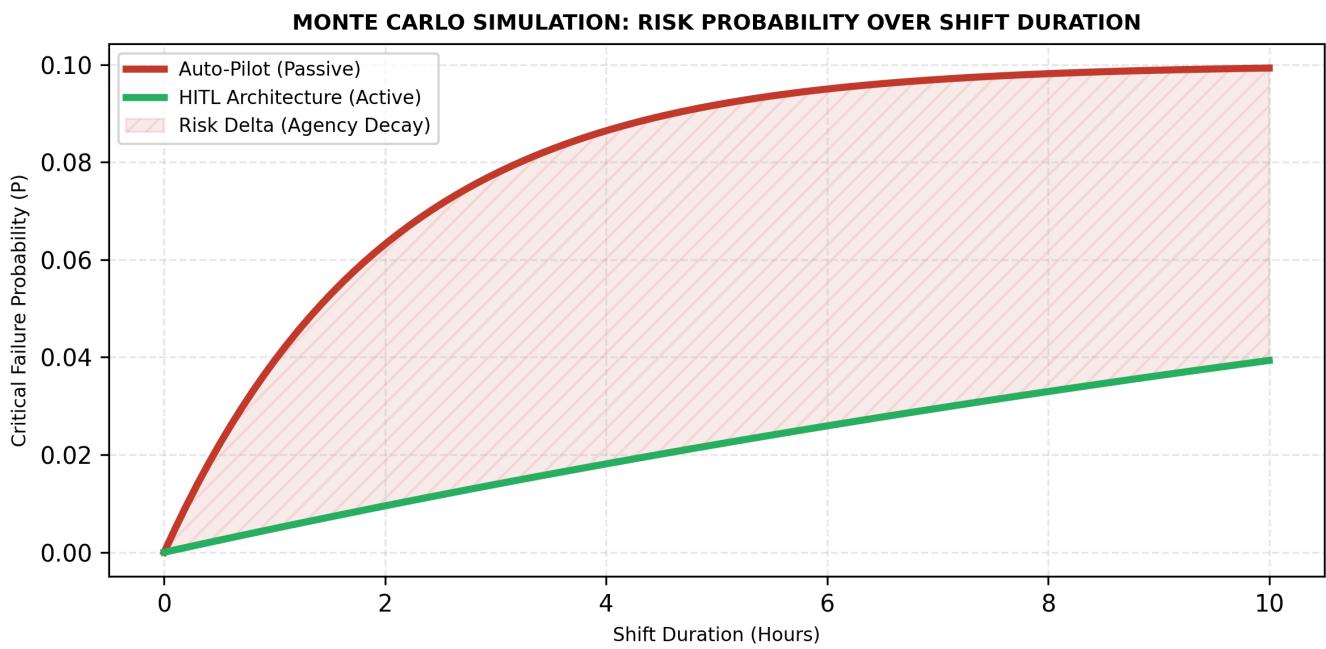


Fig 1. Simulated Risk Probability (Delta) over 10h Shift. Red Zone = Agency Decay.

## FINANCIAL FORENSICS: TOTAL COST OF OWNERSHIP (5YR)

ARCHITECTURE	SETUP COST	OPERATIONAL COST	RISK EXPOSURE (VAR)	TOTAL LIABILITY
FULL AUTO	\$1.2M	\$0.4M/yr	\$15.0M (High)	\$16.6M
HITL (Reinhardt)	\$1.5M	\$0.8M/yr	\$2.1M (Low)	\$4.4M

Fig 2. TCO Impact Analysis. The "Cheap" Automation carries hidden liability.

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# THE ARCHITECTURAL SOLUTION

To mitigate the risks observed in Fig 1, we must invert the design paradigm.

## 1. ENFORCED COGNITIVE FRICTION

The system must intentionally refuse execution until the human provides a 'Reasoning Token'. This prevents the brain from entering 'Auto-Pilot Mode'.

## 2. THE VALIDATION GATE (HITL)

We implement a logical firewall. The AI is demoted from 'Decider' to 'Proposer'. The Human is promoted from 'Monitor' to 'Judge'. This keeps the 'Vigilance Curve' (Green Line in Fig 1) stable.

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SYSTEM_LOG:  
> SIMULATION_INIT: 1000 CYCLES  
> AGENT_STATUS: AI (Prosthesis) / HUMAN (Architect)  
> RESULT: AGENCY DECAY CONFIRMED.  
> DEPLOYMENT: GIT_STAGED  
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