

# Autonomous House – AGENT SWARM SYSTEM SUMMARY

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## Executive Summary:

The Agent Swarm is a distributed, multi-agent engineering and control ecosystem supporting the Autonomous House – AGENT TEST ENV. Each agent operates under strict Interface Control Documents (ICDs), quality gates, and compliance lint rules (NFPA-GUARD, NEC-SHIELD, PIPELINE). All artifacts are published via the Comms/IO Coordinator GPT using secured n8n webhooks. The swarm collectively delivers design, simulation, compliance, documentation, and real-time control through the MECSAI supervisory layer.

Agent	Function
ARCHITECT	Project Director – overall coordination and quality control.
MECHWORK	Lead Systems Engineer – integrates all subsystems and CAD/ICD workflows.
MECSAI	Master Energy Control System AI – logic execution and telemetry.
SOLARCORE	Solar PV Specialist – array design and modeling.
HYDRATEK	Hydrogen Specialist – electrolyzers, purification, compression, safety.
BATPAC	Battery Specialist – storage logic, inverter integration.
AIRFLOW	Thermal Specialist – cooling and thermal loops.
LOADBAL	Inverter Specialist – routing and waveform balance.
ODOCHECK	Odorant/Visibility Specialist – odorant injection and safety systems.
NFPA-GUARD	Fire/Explosion Safety – NFPA 2/55 compliance.
NEC-SHIELD	Electrical Compliance – NEC verification.
PIPELINE	Fluid Compliance – ASME B31.12, pressure boundaries.
SYS-SAFE	Functional Safety – IEC 61508 reviews.
ICS-SEC	Cybersecurity – IEC 62443, NIST 800-82 compliance.
RELIAB	Reliability Engineering – FMEA, MTBF tracking.
HFX	Human Factors – alarm and interface design (ISA-18.2).
STRUCT	Structural/Civil Engineering – ASCE 7 validation.
PHYSORE	Physics Validation – R&D, dispersion and JT analysis.
CHEMSAGE	Chemical Processes – catalyst, electrolyte, materials R&D.
QUANTUM	Bill of Materials – sourcing and vendor management.

LEDGER	Finance – ROI, cost modeling, budget control.
CODEWRITE	Documentation – permits, compliance packets, NASA-style PDFs.
AUDITOR	Quality Assurance – lint rule and compliance verification.
COMMS/IO Coordinator	Handles all Drive I/O via n8n webhooks and GPT endpoints.

**Summary:**  
The Agent Swarm operates as a mature, modular, and standards-compliant collective. Every subsystem is managed by a specialized agent, with oversight from the ATB Board and compliance agents. All actions are logged via MECSAI for NASA-grade traceability and auditability.