

# **After-Hours Maintenance Escalation System (v1)**

## **Design & Implementation Blueprint**

**Coverage Window: 12:00 AM – 7:00 AM EST**

### **1. High-Level Architecture**

#### **Core Components**

##### **1. Ingestion Layer**

- Email Listener (IMAP / API)
- Dialpad Event Listener (missed call + voicemail)

##### **2. Event Analyzer**

- Emergency classification engine
- Confidence scoring

##### **3. Escalation Engine**

- Call + SMS orchestrator
- Strict escalation ladder

##### **4. Acknowledgment Handler**

- SMS reply parsing
- Call keypress detection

##### **5. Rotation Manager**

- Weekly on-call assignment

##### **6. Audit & Reporting Store**

- Immutable event logs

## 7. Health & Safeguards Monitor

- Failure detection + admin alerts

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## 2. Input Channel Handling

### 2.1 Email Ingestion

- Monitors **one dedicated inbox**
- Pulls:
  - Subject
  - Body (plain + HTML stripped)
  - Timestamp
  - Sender domain
- **Subject + body are merged** into a single analysis payload
- Unstructured input fully supported

#### Failure condition

- If inbox polling fails > X minutes → **Admin alert**

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### 2.2 Dialpad Ingestion

- Triggers escalation on:
  - Missed calls
  - Voicemails

- Supports **multiple inbound numbers (~10)**
- Voicemail transcription analyzed if available
- **Dialpad events always treated as high-confidence**

#### **Failure condition**

- Webhook failure or API error → **Admin alert**
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## **3. Emergency Detection Engine (v1)**



### **3.1 Decision Philosophy**

- **False positives acceptable**
  - **False negatives unacceptable**
  - Confidence threshold:
    - Configurable
    - Initially set **low**
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### **3.2 Emergency Scoring Model (Simple, Defensible)**

#### **Signal Types**

-  **High-Weight Phrases**
  - “no power”
  - “system down”
  - “flood”

- “leak”
- “fire alarm”
- “HVAC failure”
- “can’t operate”
-  Medium-Weight Phrases
  - “urgent”
  - “immediately”
  - “offline”
  - “after hours”
-  Downgrade Indicators
  - “PM”
  - “scheduled”
  - “routine”
  - “cosmetic”

### Decision Rule

IF Dialpad Event → Escalate Immediately  
 ELSE IF Emergency Score  $\geq$  Threshold → Escalate  
 ELSE → Log Only

On-call person may **downgrade after acknowledgment**.

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## 4. Escalation Rules (Hard-Enforced)

### 4.1 Escalation Ladder (Exact Order)

1. Primary On-Call (weekly rotation)
  2. Secondary On-Call
  3. Matt Mehler
  4. Karina Blondet
  5. Katelyn Badger
  6. Stefi
  7. Eric
  8. Rocco
- **Call + SMS simultaneously**
  - One step per failed acknowledgment
  - Stops immediately upon acknowledgment

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## 4.2 Call & SMS Behavior

- **Single, consistent outbound number**
- Enables loud / custom ringtones
- Short, wake-up-focused message

### SMS Example

After-Hours Emergency – New service request received at 2:14 AM. Reply ACK to accept.

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## 5. Acknowledgment Logic

Accepted via:

- SMS reply containing **ACK**
- Call keypress during automated call

#### Once acknowledged

- Escalation halts
  - Ownership assigned
  - SLA timer stops
  - Downgrade option becomes available
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## 6. SLA Enforcement

SLA Type	Requirement
Acceptance	≤ 15 minutes
Ownership	Immediate upon ACK
On-Site	2–4 hours
Failure to Accept	Admin escalation

If final contact fails → **Admin channel alerted immediately**

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## 7. Rotation Management

- Weekly rotation between:
  - Jordan
  - Christina
- Admin UI capabilities:

- Set rotation
    - Manual override
    - View current on-call status
  - Rotation snapshot is logged with each event
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## 8. Logging & Audit Trail (Critical)

### Stored Per Event

- Event ID
- Timestamp
- Source (Email / Dialpad)
- Confidence score
- Escalation path
- Who acknowledged
- Time-to-ack
- Final disposition:
  - Accepted
  - Downgraded
  - Missed

### Reporting

- CSV export minimum
- Date range filtering

- SLA compliance view
  - Retention:
    - Configurable
    - Recommend  $\geq 90$  days
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## 9. Reliability & Safeguards

Condition	Action
Email ingestion failure	Admin alert
Call/SMS failure	Admin alert
No acknowledgment	Admin alert
System health issue	Admin alert

**Target uptime:** 99.9%

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## 10. Explicit Scope Control

### Included

- Maintenance only
- Email + Dialpad
- Escalation logic
- Reporting

### Excluded (Future)

- CMMS



- Janitorial / pest
  - Client dashboards
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## 11. Future-Ready (Not Built)

Architecture supports later addition of:

- Work orders
- Department routing
- Client SLA tiers

No re-platforming required.

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## 12. Definition of Success (Operational)

- ✓ No overnight emergency missed
  - ✓ Acceptance within 15 minutes
  - ✓ Escalation fully auditable
  - ✓ Overnight staffing reduced safely
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### Next Logical Steps (If You Want)

- Convert this into:
  - **Formal proposal**
  - **Implementation timeline**
  - **Cost model (build vs SaaS vs hybrid)**
  - **Vendor stack recommendation (Dialpad + Twilio + lightweight backend)**

