# AFS Mutual Aid – Technical Implementation & Automation Plan

## 1. Generalized Technical Questions — Environment, Setup, and Data

### Environment & Hosting

* Which AWS GovCloud regions are in scope? Are there existing GovCloud accounts or will we stand up new landing zones?
* Are we expected to support a FedRAMP High ATO? If so, what’s the target date?
* Do we have existing IaC (Terraform/CloudFormation) patterns for networking, IAM, and VPC design?
* RTO/RPO expectations for the overall platform?
* Any need for cross-region DR within GovCloud?

### Security & Access

* Confirm identity provider (IdP) — Okta, Azure AD, AWS SSO?
* RBAC model: which roles exist (WFO Coordinator, SC, RC, Admin, Viewer) and what objects/operations can each access?
* MFA enforcement, session timeout policy.
* Audit log retention period and access controls.

### Integrations

* NWS Connect: available API endpoints, payload formats, authentication method.
* National Operational Readiness Dashboard: API access? Data pull vs. push?
* Any other NOAA or internal systems that must consume or publish mutual aid data?

### Performance & Availability

* Target ingest latency from schedule edit → available in planning UI.
* Map load time SLA (requirement says <3s for base layer).
* Maximum number of offices/shifts/scenarios to plan for in MVP vs. full rollout.

### Data & Google Scripting

* Which Google Workspace tier is in use? (Impacts Apps Script quotas.)
* For Google Sheets inputs, do we control the schema or must we adapt to existing local templates?
* Which fields are mandatory? Which are free text?
* Will Google scripts run under service accounts or individual user accounts?
* What data can legally flow through Google services given residency/compliance rules?
* Should Apps Script be read-only for authoritative data, or allowed to write back under certain conditions?

### AI/Automation Models

* Which LLMs are cleared for use (OpenAI, Anthropic, Azure OpenAI, local models)?
* Any restrictions on sending schedule/operational data to external model APIs?
* Is GPU capacity in scope for fine-tuning or hosting models in GovCloud?

## 2. Process-specific Implementation & Automation Plan

### WFO Workload Gathering & Staffing

Goal: Capture base schedules & constraints; normalize for cross-office use.

Key Inputs/Guidelines: PMEF doc, CR Critical Products List, Shift Legend, Central Region Schedules, TDY planner; Service Level Standards.

#### Proposed Implementation

* Intake microservice: ingest CSV/Sheet/API → validate → RFC Central Registry (GovCloud DB).
* Normalization/mapping to canonical schedule schema.
* Calendar/Gantt UI for viewing/editing; tagging constraints (vacation, TDY).

#### Automation Choice & Why

* Deterministic/RPA: Field presence, code validation, duplicate detection.
* LLM-assist: Map non-standard columns/codes, explain validation errors.
* Agentic: Notify owners about missing data; no auto-writes to registry.

Metrics: % valid on first load, ingestion latency, # accepted suggestions.

Open Questions: PMEF/Critical Product standardization? Prioritization approvals? Severe weather exceptions?

### Identifying Gaps & Planning Support

Goal: Detect coverage gaps, propose buddy support, prep IAP.

Key Inputs/Guidelines: Buddy System Example, CR Future Stats, Central Region Schedules; IAP Base Template.

#### Proposed Implementation

* Coverage engine: rules-driven gap math; propose buddy matches respecting constraints.
* Store proposals in registry as draft scenarios.

#### Automation Choice & Why

* Deterministic/RPA: Gap detection and proposal generation.
* LLM-assist: Explain gaps, “what changed” diffs, constraint translation.
* Agentic: Build draft scenarios and route for approval.

Metrics: Time to viable scenario, % gaps covered, manual overrides.

Open Questions: Who decides insufficiency of buddying? Priority rules for multiple gaps?

### Subregional → Regional IAP Creation

Goal: Merge subregional IAPs into master regional IAP.

Key Inputs/Guidelines: Subregional IAPs, IAP Templates; output: 2025 Mutual Aid IAP.

#### Proposed Implementation

* IAP Composer: template merge from registry data.
* Version control with diffing; RC approval required.

#### Automation Choice & Why

* Deterministic/RPA: Template fill, ordering, consistency checks.
* LLM-assist: Normalize free-text sections, grammar/clarity, create 1-page summary.
* Agentic: Remind approvers, track missing sections.

Metrics: Compile time, template errors, # revision cycles.

Open Questions: Current merge/manual split? Required version control practices?

### Mutual Aid Status Tracking & Execution

Goal: Keep status/map current without manual daily survey.

Key Inputs/Guidelines: Mutual Aid Options Coordination Sheet, National Operational Readiness Dashboard, Reduced Service Ops template.

#### Proposed Implementation

* Status service: subscribe to registry changes, compute publishable status.
* NWS Connect publisher: transform & push status payloads; log/verify.

#### Automation Choice & Why

* Deterministic/RPA: Schema/value validation, publish.
* LLM-assist: Explain anomalies, summarize changes.
* Agentic: Notify on publish failures or stale data; no direct edits.

Metrics: Publish success rate, change→map latency, anomalies resolved.

Open Questions: Can survey be retired? Single source of truth for status?

### Audible Requests

Goal: Capture and route unplanned support needs.

Key Inputs/Guidelines: Short Notice Mutual Aid Playbook; outputs: updated IAP, map.

#### Proposed Implementation

* Quick-entry form + chat intake (if approved) → structured record in registry.
* Route to SC/RC; require approval before publish.

#### Automation Choice & Why

* Deterministic/RPA: Minimum fields, policy checks, routing.
* LLM-assist: Parse free-text/chat into structured request, propose staffing patch.
* Agentic: Follow up for missing info; no auto-publish.

Metrics: Request→decision time, % via quick-entry, conflicts caught.

Open Questions: Prioritization vs. planned mutual aid? Structured form definition?

## 3. Automation Decision Matrix

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Process Step | Deterministic / RPA | LLM-Assist | Agentic AI | Notes |
| WFO Workload Gathering & Staffing | ✔ | ✔ | Limited | Strict validation + mapping assistance. |
| Identifying Gaps & Planning Support | ✔ | ✔ | ✔ (assist) | Gap math + human-approved scenarios. |
| Subregional → Regional IAP Creation | ✔ | ✔ | Limited | Template merge + text normalization. |
| Mutual Aid Status Tracking & Execution | ✔ | ✔ | Limited | Map publishing + anomaly alerts. |
| Audible Requests | ✔ | ✔ | ✔ (assist) | Intake, parsing, routing; no auto-apply. |