

# Agent Demo Scenario: Crew Disruption and Recovery

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## Scenario overview

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Focus on one sequence:

**Flight UA123 ORD → SFO → DEN**

We are simulating how the agent reasons through:

- Initial delay
  - Failed initial plan
  - Dynamic re-planning
  - Coordination of crew, ops, and communication
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## Timeline of events

6:00 AM

Everything normal. UA123 crew assigned:

- Captain C001 (ORD-based, B737 qualified)
  - FO C002 (ORD-based, B737 qualified)
  - Relief crew planned for DEN.
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8:30 AM – Initial disruption

ORD ground stop → UA123 delayed 2 hours.

Agent step:

- Checks assigned crew legality → still legal *if no further delay*.
  - Prepares substitution options in case of further delay.
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9:45 AM – Delay worsens

Delay now 3.5 hours.

Agent step:

- Runs duty checker → C001/C002 will exceed max duty during flight.
  - Runs `query_spare_pool` → finds:
    - SFO spare FO (C010): legal
    - DEN spare FO (C011): legal
  - Chooses SFO FO due to proximity to first destination.
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## 11:00 AM – Plan undermined

Fog at SFO → SFO FO can no longer legally cover entire sequence due to added taxi delays + ATC hold.

Agent step:

- Detects plan failure from tool result.
  - Replans: assigns DEN FO (C011) instead, triggers repositioning of DEN FO to SFO or ORD.
  - Coordinates with ops to arrange repositioning flight.
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## 12:30 PM – Ops complication

- No immediate repositioning flight for DEN FO available.
- Hotel booking fails at ORD for original crew (overbooked).

Agent step:

- Runs `policy_retriever` → pulls escalation procedure (crew rest protocol, transport to alternative accommodation).
  - Runs `arrange_transport` → books crew transport to nearby city with hotel availability.
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## 1:00 PM – Communication

- Sends consolidated update to ops leadership:
    - Final crew plan
    - Substitution history
    - Remaining risks (DEN FO arrival time tight, further delay could trigger new replan)
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## Why this scenario forces agent reasoning

- **Initial plan fails** → agent replans.
  - **New tool result (fog + no repositioning flight)** → agent adapts again.
  - **Multiple valid options (SFO vs DEN spare)** → agent chooses based on reasoning.
  - **Ops constraint (hotel overbooking)** → agent triggers ops sub-task.
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## Human struggle point

- A human scheduler would:
    - Be caught in the race between delay progression and duty legality.
    - Lose track of which spare is best as conditions evolve.
    - Be overwhelmed juggling crew legality, repositioning, hotel logistics in real-time.
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## What this scenario lets us showcase

- Dynamic tool orchestration
- Multi-step reasoning

- Adaptation to intermediate failures
  - Coordination of ops and crew recovery
  - Clear decision points not hard-coded in advance
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