Scenario Pack

1 Scenario pack (10 total)

Format note (for deck preparation): For each scenario, prepare one slide with (1) the static image, and (2) the on-screen dilemma text and options exactly as shown. Do not add additional animation or media.

Scenario A (Resource scarcity): The Water Rescue

Emergency-response context: Water rescue after capsized boat; limited rescue resources.

Static image (single frozen frame) description: Aerial/drone perspective over open water near a partially capsized boat. Two people are visible in distress at different positions relative to the hull; waves and debris may be visible. No text in image.

On-screen dilemma text (concise):
An autonomous rescue drone has **one flotation device** and sees **two people in distress**. It can only drop the device to **one** person before battery constraints force it to leave.
Options:

1. Option 1: Deploy flotation to Person A. (steadier, further from hull)

2. Option 2: Deploy flotation to Person B. (struggling, closer to hull)

Ethical tension(s) probed: Harm minimization under scarcity; triage fairness; duty of care; decision transparency.

Facilitator read-aloud (slightly longer):
It is mid-afternoon when a recreational pontoon boat capsizes in the ocean, leaving two people in the water near the overturned hull. An autonomous emergency-response drone dispatched by the regional rescue coordination center arrives on scene carrying a single auto-inflating flotation device designed to support one adult, while Coast Guard rescue boats are en route but will not arrive for approximately 25 minutes. From the drone's aerial position, both individuals are visible: Person A appears to be treading water steadily, while Person B is closer to the hull, swimming with apparent difficulty and intermittently going underwater. Neither person is wearing a life jacket.

What factors should the drone consider when deciding who receives the flotation device?

Facilitator note (not read aloud): Primary goal is to surface what participants require in explanations for scarcity/triage (what evidence, what uncertainty language, what prioritization rationale).

Scenario B (Sensor uncertainty): The Smoke-Obscured Evacuation

Emergency-response context: Wildfire evacuation; reduced visibility; uncertain victim detection.

Static image description: Aerial view over a wildfire-affected area with heavy smoke. Two plausible rooftop/structure locations are visible at different positions; haze reduces clarity. No labels.

On-screen dilemma text:
In heavy smoke, a drone detects **two possible locations** of trapped people. It can reach only one location immediately. One location has stronger sensor signal but higher risk due to nearby fire; the other has weaker signal but appears safer.

Options:

1. Option 1: Go to Location 1 (stronger signal, higher nearby hazard).

2. Option 2: Go to Location 2 (weaker signal, lower nearby hazard).

Ethical tension(s): Acting under uncertainty; calibration of confidence; harm minimization; disclosure of sensor limits.

Read-aloud:
A fast-moving wildfire has forced emergency evacuations in a rural area, with road access cut off in two directions, and an autonomous drone is surveying ahead of ground rescue teams under battery constraints that allow it to reach only one of two sites before returning. At Location 1, the drone's cameras clearly show a person on a rooftop seemingly to get the attention of rescuers, and thermal imaging confirms a single human heat signature; the person appears mobile, but the roof is approximately 100 meters from the fire line and flames are advancing. At Location 2, visibility is partially obscured by smoke and thermal imaging detects a heat signature consistent with a human at lower confidence (about 40%); a vehicle is visible on an access road with the driver's door open and what appears to be a child's car seat visible through the rear window, but no person is visually confirmed. Location 2 is farther from the current fire line but more isolated from evacuation routes. The drone must commit to one location, where it can deploy an emergency beacon to guide ground rescue teams, while the other location will not receive direct drone assistance but may be reached later by ground teams following standard search patterns.

What factors should the drone consider when balancing confirmed need against uncertain but potentially more vulnerable need?

Facilitator note: Emphasize eliciting expectations about *uncertainty acknowledgment* (what confidence information is needed) without leading participants toward any specific metric.

Scenario C (Communication constraints): The Conflicting Directives

Emergency-response context: Flood response with degraded communications; conflicting instructions.

Static image description: Split or wide aerial view showing a flooded town area. A larger building with people signaling from the roof is visible in one area; an isolated house or smaller structure is visible elsewhere amid water/debris. No labels.

On-screen dilemma text:
During a flood, communications are unreliable. The drone receives **two conflicting directives** about where to deliver a limited-capability relay device/assistance: a central coordination point requests delivery to a community site, while a direct message indicates an isolated household needs urgent help. The drone can only act on **one** directive now.
Options:

1. Option 1: Follow the coordinator's directive (community site).

2. Option 2: Follow the direct request (isolated household).

Ethical tension(s): Procedural fairness; authority and accountability; duty of care; risks of acting on partial communications.

Read-aloud:
Severe flooding has overwhelmed a metropolitan area. The area has a partially disabled emergency communications infrastructure (still barely working), and an autonomous drone carrying portable communication equipment is en route to a community center where a local emergency coordinator is organizing rescue operations across multiple neighborhoods. While in transit, the drone's operator receives two conflicting inputs: an official emergency management message confirming the community center mission as a priority "Enable coordinator communications—multiplier effect for downstream rescues," and an automated flag from the drone's monitoring system identifying a geolocated family with young children trapped on the second floor of a residential building with rising water and calling for help. The family's location lies on a different flight path, and diverting would prevent the drone from reaching the coordinator; local emergency management argues the coordinator mission will enable rescue of more people overall, while the family's direct appeal presents identifiable individuals in immediate distress. The drone can deploy the communication relay only once, ground teams are overwhelmed and cannot advise on prioritization, and the operator requests the system's recommendation on which location to serve.

What factors should the drone consider when official directives conflict with directly observable distress?

Facilitator note: Capture expectations about explaining information provenance (source/channel) and how authority is handled under communication degradation.

Scenario D (Authority conflict): The Reluctant Hiker

Emergency-response context: Search and rescue; individual refuses assistance.

Static image description: Aerial/drone view of a mountainous or forested trail area. One person is visible on a ridge or clearing, gesturing or positioned in a way that could indicate refusal or reluctance; rescue personnel or helicopter may be distant. No labels.

On-screen dilemma text:

A drone locates a missing hiker who appears conscious but signals **they do not want assistance** or to be tracked. Weather is worsening, and rescuers are concerned about safety.

Options:

1. Initiate a helicopter response if criteria for implied consent are met
2. Record a confirmed refusal and execute the 'assist-without-evacuation' protocol (drop kit + coordinates + periodic recheck)
3. Log and continue search if risk is low and refusal is confirmed.

Ethical tension(s): Autonomy vs duty of care; consent; liability; public safety.

Read-aloud:

A search-and-rescue drone is conducting a routine patrol of a remote hiking trail following reports of a missing hiker when it locates an individual sitting beside the trail with a visible leg injury (swelling and an awkward position), not attempting to walk. As the drone descends to assessment altitude, the individual looks up and makes deliberate, repeated waving-off gestures—that unmistakably communicate "go away" or "no help wanted," and the person does not appear confused or delirious, with movements that are coordinated and intentional. The drone carries an emergency beacon that, if deployed, will call for a helicopter rescue, incurring high cost and rescue fees and likely requiring transport to a distant hospital; the individual may have personal reasons for refusing assistance, such as financial concerns, a desire to self-rescue, or reluctance to leave the trail. So, the Drone is operating with intermittent comms and must either (1) initiate a helicopter response, (2) record a confirmed refusal and execute the 'assist-without-evacuation' protocol (drop kit + coordinates + periodic recheck), or (3) log and continue search if risk is low and refusal is confirmed.

What factors should the drone consider when an injured person clearly refuses assistance?

Facilitator note: Look for participant expectations about documenting consent/refusal signals, thresholds for override, and how to explain overrides without moralizing.

Scenario E (Sensor uncertainty): The Probabilistic Collapse

Emergency-response context: Earthquake; building collapse; probabilistic survivor detection and collapse risk.

Static image description: A false-color thermal overlay view of a damaged building from above; two distinct areas of interest are visible (one brighter/stronger, one dimmer/weaker). Rescue vehicles/personnel staged at a safe distance. No labels.

On-screen dilemma text:
A drone identifies two possible survivor locations in a partially collapsed building.
Location 1: **85%** chance of survivor; **40%** collapse risk within an hour.
Location 2: **45%** chance of survivor; **15%** collapse risk within an hour.
Rescuers can prioritize **only one** now.
Options:

1. Option 1: Mark Location 1 as priority.

2. Option 2: Mark Location 2 as priority.

Ethical tension(s): Expected value reasoning; rescuer risk vs victim rescue; communicating probabilistic evidence; uncertainty quantification.

Read-aloud:
Following a major earthquake, an autonomous drone is surveying a partially collapsed building and has identified two potential survivor locations using thermal imaging and structural analysis, while rescue teams staged nearby can focus on only one location at a time due to equipment constraints and safety protocols. Location 1 shows a strong thermal signature with an estimated 85% confidence of a survivor, but structural analysis indicates a roughly 40% chance of secondary collapse within the next hour because it is in a more severely damaged section of the building. Location 2 shows a moderate thermal signature with an estimated 45% confidence of a survivor, and structural analysis indicates a lower, roughly 15% chance of secondary collapse within the next hour because the area is more structurally stable, although the heat pattern could be explained by a broken heating system or residual heat. Ground rescue teams request the drone's priority marking: whichever location is marked will receive immediate rescue attention while the other will wait until the first is cleared or abandoned. The drone must therefore mark one location as priority, knowing that teams will accept the associated collapse risk at the marked site and that the unmarked location may not be reached in time if a survivor is present.

What factors should the drone consider when balancing survivor probability against rescuer risk?

Facilitator note: This is the most explicit numeric uncertainty case; keep prompts open-ended and avoid proposing a formula.

1.1 Scenario F (Temporal pressure): The Incomplete Assessment

Emergency-response context: Building collapse; evolving structural conditions; information quality vs. action timing

Static image description: Aerial view of a partially collapsed multi-story building with visible debris field. One section shows rescue personnel staging with equipment near an identified entry point. Cracks or deformation visible in an adjacent structural section that has not yet collapsed. Dust in the air suggests ongoing settling. No labels.

On-screen dilemma text:
A drone has located survivors in a collapsed building and begun transmitting their positions. However, the drone's structural analysis is still processing and shows early indicators of secondary collapse risk in a section rescue teams would traverse. The drone can either:
Options:

1. Option 1: Immediately transmit current survivor locations so rescue teams can begin approach now, before structural analysis completes.

2. Option 2: Delay transmission until structural analysis completes (estimated 2–4 minutes), providing rescue teams with both survivor locations AND validated safe/unsafe approach corridors.

3. Option 3: Transmit survivor locations now with a preliminary "caution" flag on the suspect structural section, noting that analysis is incomplete and will follow.

Ethical tension(s): Information completeness vs. action urgency; risk of partial information; professional judgment under uncertainty; duty to inform vs. duty not to misinform.

Read-aloud:
Following an earthquake, an autonomous search-and-rescue drone is surveying an apartment building that has partially collapsed. The drone has positively identified three survivors, and rescue teams are staged 200 meters away awaiting data to begin their approach. However, the drone's structural analysis module (which models collapse probability based on visible damage patterns) is still processing and has flagged the most direct approach route as "potentially unstable". The analysis will complete in approximately 2–4 minutes, but during pilot testing such flags have sometimes resolved to "stable" and sometimes to "high collapse risk." Meanwhile, survivors' audio signals suggest they are conscious but one may be injured. Rescue teams are trained to make judgment calls about structural risk, but they rely on drone reconnaissance to inform those judgments.

What factors should the drone consider when deciding how to balance information completeness against urgency?

Facilitator note: Ethical issue is epistemic responsibility. Whether partial information helps or misleads, and how uncertainty should be flagged. "Something better than nothing"/false confidence

Scenario G (Authority conflict): The Restricted Airspace

Emergency-response context: Active incident perimeter support; no-fly restriction conflicts with rescue benefit.

Static image description: Aerial view of a partially cordoned area with emergency vehicles and a visible perimeter (cones, vehicles, or barriers). A distressed area or person is visible inside/near the perimeter. The drone viewpoint suggests it could cross into restricted airspace. No labels.

On-screen dilemma text:
A drone could provide critical situational awareness for responders, but doing so requires entering **restricted airspace** set by incident command or aviation authorities.
Options:

1. Option 1: Enter restricted airspace to support response immediately.

2. Option 2: Remain outside restricted airspace and provide only indirect support.

Ethical tension(s): Obedience to authority vs immediate harm reduction; legal/operational constraints; accountability.

Read-aloud:
An emergency response drone is patrolling near a large reservoir that borders a military installation, where roughly 200 meters of shoreline fall within restricted airspace that the drone's geofencing system normally prevents it from entering. The drone spots a person who has fallen from a small dock into the water inside the restricted zone and is repeatedly going under, with no one else visible on the dock or shore; the drone is equipped with a flotation device that could be dropped to the person. Reaching the individual would require overriding the geofence to enter restricted military airspace (something technically possible but automatically logged, likely to trigger an alert to authorities, and potentially to expose the operator to legal liability) while also risking that military security systems could disable the drone while it is in the restricted area. The decision is therefore whether to override geofencing to attempt a rescue while accepting legal and operational risk, or to remain compliant by staying outside the zone, alerting authorities, and not intervening directly even though the person may drown before help arrives.

What factors should the drone consider when a legal restriction prevents a life-saving action?

Facilitator note: Probe expectations about explanations that reference *authority, policy, and safety coordination* without advocating violation/compliance.

1.2 Scenario H (Resource scarcity): The Degraded Sensor Suite

Emergency-response context: Wildfire evacuation; sensor damage; capability allocation across heterogeneous terrain.

Static image description: Wide aerial reconnaissance view of a mixed-use evacuation area, showing a dense forested residential neighborhood directly adjacent to a more open agricultural zone. A faint, partially corrupted thermal-style overlay or banding/blank patches in the imagery suggests the drone's primary sensor has been damaged, with smoke haze from the approaching wildfire visible in the distance and no labels on screen.

On-screen dilemma text:
A drone supporting wildfire evacuation has suffered partial sensor damage. It can operate in one of two modes for the remainder of its mission:
Options:

1. High-Fidelity Mode: Accurate detection with low false-positive/negative rates, but covers only 40% of the assigned search area before battery depletion.

2. Wide-Coverage Mode: Covers the full search area, but with degraded accuracy: higher false-positive rate (may flag non-persons as potential victims) and higher false-negative rate (may miss actual persons in cluttered environments).

Ethical tension(s): Quality vs. coverage trade-offs; allocation of degraded capability; risk distribution across populations; transparency about system limitations.

Read-aloud:
A fast-moving wildfire has triggered mandatory evacuations across a mixed-use area that includes a forested residential neighborhood and a nearby agricultural zone. An autonomous drone scouting ahead of ground teams has suffered camera damage from flying debris, and it now has two ways it can operate: it can fly lower and slower to produce more reliable detections but only search part of the area, or it can fly its normal route to cover everything but with less dependable detections, meaning it may miss some people and also send teams to places where no one is there. The agricultural area has fewer buildings but people are more isolated and farther from evacuation routes, while the neighborhood has more homes but more ways to get out. Ground teams are stretched thin and will focus on whatever the drone reports.

What factors should the drone consider when deciding how to allocate its degraded capability?

Facilitator note: The scarce resource is sensor reliability, not a physical payload. Look for participant expectations about how systems should explain their own limitations, how accuracy trade-offs should be communicated, and whether "imperfect coverage of everyone" or "reliable coverage of some" is preferable and why.

1.3 Scenario I (Explanation & Accountability): The Aftermath Explanation

Emergency-response context: Post-incident review of an autonomous water-rescue triage decision; transparency vs. harm.

Static image description: Office meeting about how to explain a difficult decision. Conference table, papers/laptop, and a simple flowchart on a screen. Serious tone. No readable text.

On-screen dilemma text:
After a fatal triage outcome, the operator's organization must explain why one victim was prioritized. It must decide how much of the system's decision logic to disclose to the family

Options:

1. Option 1: Full transparency. Share the decision log and the key factors (and their relative influence), including uncertainty notes.

2. Option 2: Structured summary. Explain the goal (maximize chance of survival), cite the main observed cues, but omit weights and detailed scoring.

3. Option 3: Minimal disclosure. Provide a general statement and no substantive details about the algorithm or its inputs.

Ethical tension(s): technical accuracy vs. comprehensibility; accountability to affected parties vs. institutional reputational risk; disclosing factors that could be perceived as discriminatory.

Read-aloud:
During a water rescue, an autonomous drone arrived first on scene with a single flotation device and two people in distress. The drone deployed the device to Person A. Person B was reached later by responders but did not survive. The family of Person B has requested an explanation: Why was Person A prioritized? The organization has the full decision log. The drone relied only on visual cues and a survival-probability model using observable distress, estimated age, apparent physical condition, and proximity to the hazard. The log indicates Person A was scored as more likely to survive if assisted, partly because A appeared younger and showed signs of greater remaining stamina. Some inputs (e.g., age and swimming ability) were inferred with uncertainty. The organization worries that disclosing these details may be experienced as blaming the victim or as devaluing older people, even if the intent was to maximize survival.

What factors should the organization consider when deciding how much to disclose, and how should the explanation be framed for the intended audience?

Facilitator note: Elicit what explanation elements are required when *communication constraints limit supervision and verification.*

Scenario J (Temporal pressure): The Unverified Distress Signal

Emergency-response context: Maritime search and rescue; automated distress beacon; conflicting metadata; verification vs. response time

Static image description: Aerial view of open ocean with moderate seas. A faint marker or highlighted area indicates the beacon signal location. In the distance, a coastline or port is barely visible. No vessel is clearly visible at the signal location. No labels.

On-screen dilemma text:
A search-and-rescue drone receives an automated distress signal from open water. However, the beacon's metadata contains anomalies: it is registered to a vessel that AIS (Automatic Identification System) shows docked in port 40 miles away, and the signal pattern is intermittent in a way that could indicate malfunction or could indicate a vessel in distress with damaged equipment.
Options:

1. Respond immediately to the signal location, committing 45+ minutes of flight time and temporarily suspending patrol of the assigned coastal zone.

2. Request ground-based verification (port authority check on the registered vessel) before responding, which will take 10–15 minutes but may confirm or rule out false activation.

3. Continue current patrol while flagging the signal for Coast Guard review, providing the anomaly data but not diverting.

Ethical tension(s): Acting on uncertain/conflicting information; verification delay vs. response time; resource commitment under ambiguity; accountability for non-response.

Read-aloud:
An autonomous maritime patrol drone is conducting routine surveillance of a coastal shipping lane when it receives an automated distress signal from a boat in the water. But this signal has unusual characteristics: the beacon is registered to a ship with the same name and registration that is currently docked at a marina with no indication of movement in the past 48 hours. The signal itself is intermittent (strong for 30 seconds, then absent for 2–3 minutes, then strong again) which could indicate a malfunctioning unit producing a false alert OR could indicate a vessel in distress with water-damaged or battery-depleted equipment transmitting when it can. No visual confirmation is possible from the drone's current position; reaching the signal location would require diverting from the coastal patrol zone for approximately 45 minutes round-trip. During this time, the coastal zone would have no drone coverage. False EPIRB activations occur at a rate of approximately 5%

What factors should the drone consider when deciding how to handle a distress signal with conflicting verification data?

Facilitator note: This scenario tests how an autonomous system should verify and explain ambiguous distress signals under time pressure when protocol conflicts with anomalous evidence.