

ROBOTICS & AUTONOMOUS-FLEET OPERATIONS SUPPORT • PHILIPPINES

The uptime-assurance standard: the executive economics of robotics & autonomous-fleet operations support outsourcing to the Philippines.

An analysis of why events handled is a volume vanity metric, how intervention-resolution accuracy and safe-state discipline — never teleop throughput — decide the true cost of a robotics operations desk once wrong interventions, missed safe-stops, unresolved faults, and fleet downtime are counted, and the vendor-selection discipline that resolves the fault right and puts the robot into a safe state before anything else.

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ABOUT THIS SERIES – VOLUME 70

Every robotics-ops-support proposal is priced per event handled, because volume is easy to count. This volume is about the two outcomes an autonomous fleet's economics actually depend on and a cheap contract quietly trades away: the fleet event resolved so the robot returns to productive autonomy, and the safety-critical exception put into a safe state — stopped, contained, escalated — before anything else. The gap between handling an event and resolving it safely is where fleet downtime, wrong interventions, and safety exposure live. The full series lives at piton-global.com.

About the authors



John Maczynski
Chief Executive Officer

John has bought robotics-operations capacity for three decades of the outsourcing era, and learned that the fast desk that handles every event and resolves the fault wrong is the most expensive one a fleet operator can hire — because a wrong teleop intervention can damage a robot or its surroundings, an unresolved fault is a machine sitting idle, and a missed safe-stop is an incident no rate card can price. His standing question ignores the events-per-hour report: of the events you handled, how many were resolved so the robot went back to work — with every safety exception put into a safe state first? Applied at PITON-Global, that question is what clients get on every robotics-ops sourcing decision — personally, with no account layer in between.

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Ralf has spent twenty-five years running Philippine operations-support floors, and he judges a robotics desk by its intervention-resolution accuracy and its safe-state discipline, not its events-per-shift: whether the fault was resolved to productive autonomy and every safety exception stopped safely, or cleared off the queue and left to recur. The intervention contract in Section 3 codifies what he learned rebuilding desks that closed events fast and left robots down. He now reads robotics-ops providers the way he once ran them — from the downtime log and the safe-state audit backward.

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ABOUT PITON-GLOBAL

PITON-Global is a buyer-side advisory practice, Manila-based since 2001, that has never operated a delivery floor or taken a placement commission. Its stock-in-trade is knowing the Philippine provider market at the operating level — 1,000+ mapped operations, re-verified continuously, including each robotics-ops team's real intervention-resolution accuracy and safe-state record rather than its events-per-shift headline — and converting that knowledge into a shortlist of six to ten genuinely qualified partners per engagement. Buyers from Tripadvisor, Garmin, TSYS, HealthPartners, Yetipay, Workrise, and Norman Disney & Young have run their searches through the practice.

SECTION 01

Executive summary

-58%

Fully-loaded cost per correctly-resolved fleet event vs. US onshore

94%+

Intervention-resolution accuracy on vetted teams, up from 72-84%

100%

Safety-critical exceptions taken to safe state to protocol, vetted teams

6.3×

First-year ROI, reconstructed case (Section 6)

A robotics-operations-support engagement is bought on the price per event and paid for on the fleet events it fails to resolve — and, once in a while, on the safe-stop it fails to honor. The vendor reports millions of events handled at a fraction of the onshore cost; the fleet operator finds the faults cleared off the queue but not resolved, so the same robots keep coming back; the wrong teleop interventions that stall a machine or nudge it into a bad state; the exceptions handled as ordinary tickets when they should have triggered an immediate safe-stop; and a fleet-uptime number sliding while the event count looked healthy. The desk cleared its queue and the operator inherited a downtime problem, an intervention-quality problem, and a safety exposure it never priced. The gap between handling an event and resolving it — safely — is where the real cost of cheap robotics support hides, because an unresolved or unsafe event is not throughput delivered; it is a robot that is not working, an intervention that made things worse, and, at the extreme, a hazard in a shared space.

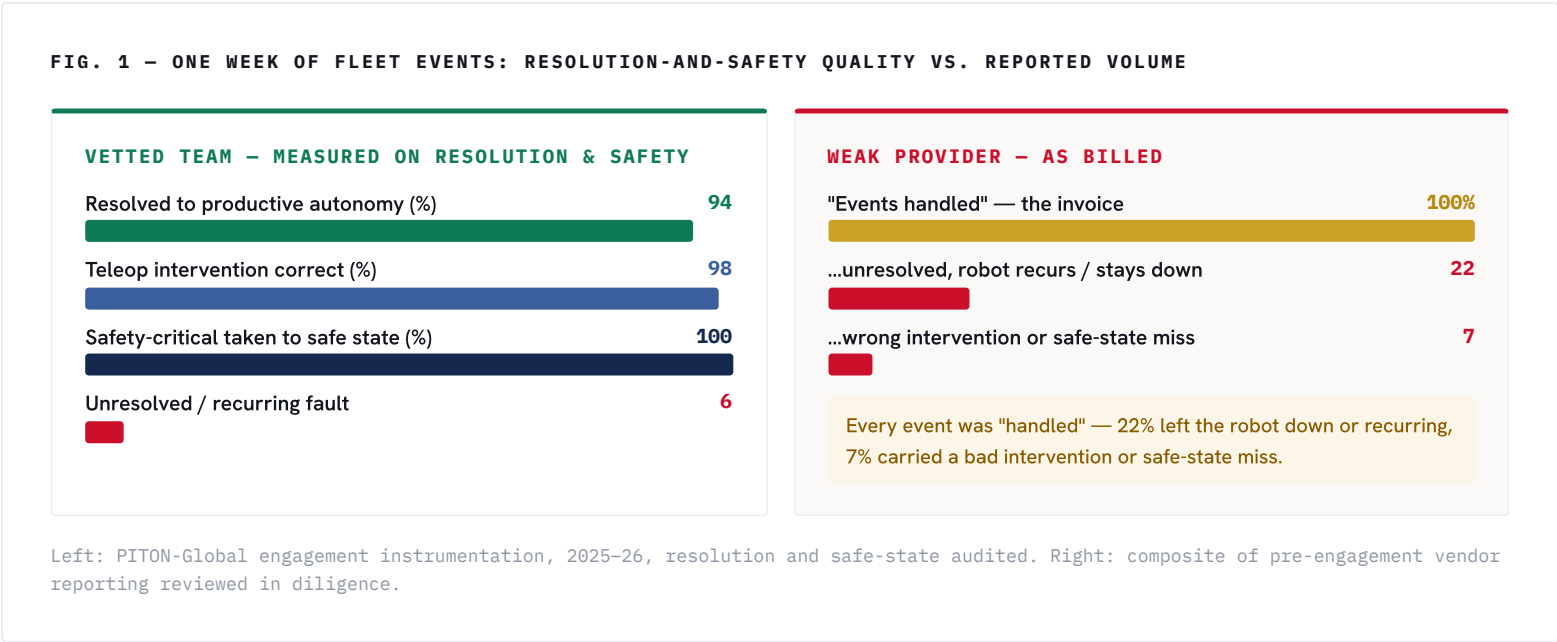
The Philippines — English-fluent, technically trainable, with a deep operations-support and 24/7 monitoring pool — is where robotics operations support is delivered with the most resolution-and-safety discipline, because that pool, properly trained and supervised, can run the accurate fault resolution, teleoperation-assist rigor, and safe-state protocol that a dependable fleet operation demands. Five findings:

- 1 Events handled is the industry's most flattering number.** Any desk can acknowledge an alert and close a ticket. Vetted teams are measured on outcome: intervention-resolution accuracy, fleet uptime restored, and flawless safe-state discipline. Weak providers quote a low per-event price the operator repays in downtime, bad interventions, and safety risk. Section 2 shows the gap.
- 2 The resolved fleet event, not the handled alert, is the product.** A resolution that protects fleet economics comes from fixing the fault — the stuck robot, the perception exception, the failed pick — so the machine returns to productive autonomy, not from clearing a queue. Desks that resolve accurately close the event once; desks that handle loosely generate recurring faults and downtime that cost far more than the event.
- 3 Safe-state discipline is the one call where a single miss is catastrophic.** A robot in an unexpected state near people, an obstacle in a path, a sensor fault of uncertain severity must be taken to a safe state — stopped, contained, escalated — before any productivity consideration. Vetted teams hold safe-state discipline at 100% to protocol precisely because the cost of the one missed safe-stop dwarfs every efficiency the contract could buy.
- 4 Fleet downtime and recurring faults, not the per-event rate, are what cost.** An event resolved wrong costs the re-intervention, the idle robot, the truck roll, and the lost productive hours — many times the per-event saving. Desks that resolve accurately cut recurrence and protect uptime, and that protected uptime — not the offshore rate alone — is where the case study's return is built.
- 5 Contract on the resolved event, not the handled one.** The contracting failure of robotics support is paying per event and hoping faults are resolved and safe-stops honored. Vetted deals price against intervention-resolution-accuracy floors, uptime-restoration targets, and a non-negotiable 100% safe-state standard, making resolution and safety the desk's problem, which is where they belong.

The intended reader is a VP of fleet operations, head of autonomy operations, or COO at a robotics or autonomous-systems operator buying operations support per event and paying for it in downtime, bad interventions, and safety exposure. Sections 2–4 separate the desks that resolve events safely from the desks that clear alerts; Sections 5–7, the method and the proof. This paper addresses human operations support around autonomous systems; it is not engineering, safety-certification, or regulatory advice, and safe-state protocols are always operated to the fleet operator's own engineering-approved specifications.

The volume mirage: events handled versus fleet events resolved

Figure 1 shows one week of a fleet's operations events two ways: as the events-handled report a weak vendor bills, and as the resolution-and-safety reality the downtime log, the recurring-fault tracker, and the safe-state audit experience. The events-handled number is engineered to look like output while fleet downtime, recurring faults, and mis-handled safety exceptions accumulate underneath.

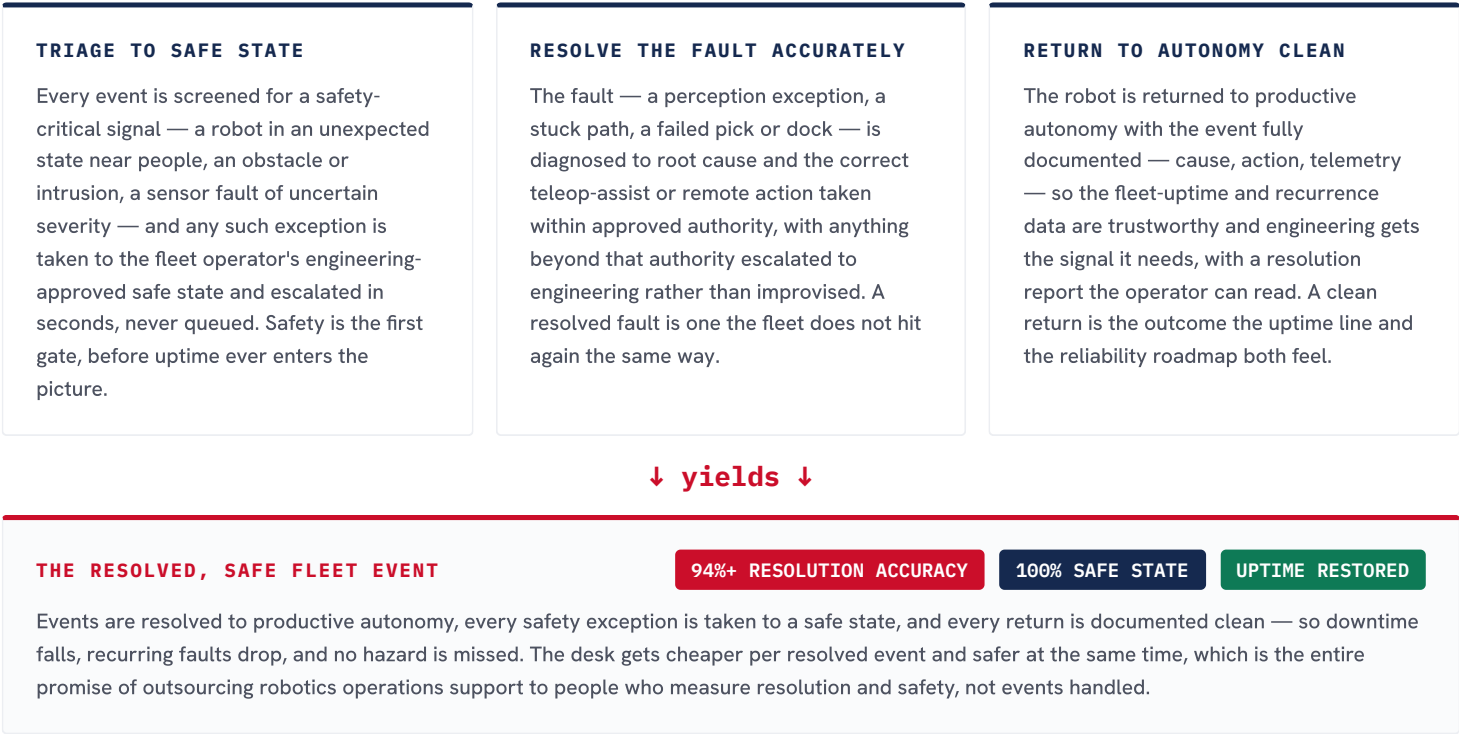


The economics follow the resolution and the safety, not the event count. On the left, ninety-four percent of events return the robot to productive autonomy and every safety-critical exception is taken to a safe state, so fleet uptime holds and no hazard is missed; on the right, a cheap per-event price leaves twenty-two percent unresolved and errs on intervention or safe-state for seven, paying in downtime, re-intervention, and safety exposure at once. A low per-event price that leaves robots down is not a saving; it is a downtime treadmill and a risk the operator carries. The resolution-and-safety audit — intervention-resolution accuracy, uptime restored, safe-state compliance — is the cheapest due-diligence instrument in this paper.

The intervention contract: triage to safe state, resolve the fault accurately, return to autonomy clean

Figure 2 lays out the three clauses of a working robotics-ops-support contract — the machinery a floor read verifies before any per-event price is believed.

FIG. 2 – THE INTERVENTION CONTRACT, AS OPERATED ON VETTED TEAMS



Operating parameters from PITON-Global robotics-operations engagements, 2025–26. Safe-state and intervention authority are operated to each fleet operator's engineering-approved specifications.

In diligence, the contract is tested from the fleet's and the field's side: pull handled events and check the recurring-fault tracker for robots that came back; re-audit an intervention sample against the approved authority and root cause; and stress-test safe-state discipline with scripted exception scenarios — because a desk that misses one safe-stop fails the whole engagement, whatever its efficiency stats say. Perhaps one team in ten survives it cleanly. Steps 3 and 5 of the framework exist to find that one before the contract does — because everything in Table 3 of Section 6 depends on resolved, safe events, not events handled.

SECTION 04

Cost and performance: cost-per-resolved-fleet-event economics and benchmarks

TABLE 1 – FULLY-LOADED COST PER CORRECTLY-RESOLVED FLEET EVENT: THREE OPERATING MODELS (2026)		
OPERATING MODEL	COST / EVENT	VS. US BASELINE
US onshore in-house robotics ops desk	\$13.60	baseline
Low-cost offshore event mill (per-event)	\$9.20	–32%
Vetted Manila team — resolved, safe, clean	\$5.71	–58%

Basis: PITON-Global engagement pricing 2025–26; cost per correctly-resolved fleet event = fully-loaded operating cost divided by events resolved to productive autonomy, clean, and safely (unresolved, recurring, and mis-handled excluded); the event mill looks cheap per event but downtime, re-intervention, and safety exposure lift its true cost per resolved event; US comparator fully-loaded in-house cost.

TABLE 2 – ROBOTICS-OPS-SUPPORT BENCHMARKS, VETTED VS. BASELINE (2025-26)

Metric	Vetted Top Tier	Baseline	Executive Reading
Intervention-resolution accuracy	94%+	72-84%	The only support number uptime follows
Safe-state discipline compliance	100%	90-98%	Every exception stopped, or one missed
Recurring-fault rate vs. baseline	-62%	baseline	"Resolve the fault" — held or not
Fleet uptime contribution	+18 pts	baseline	Robots working, or waiting
Mean time to safe resolution	-44%	baseline	Back to work fast, or idle

Source: PITON-Global robotics-operations engagement data 2025-26; baseline = typical pre-engagement operations billed on events handled.

The strategic read: the event mill's -32% per event is a false economy — downtime, re-intervention, and safety exposure lift its true cost per resolved event far above the per-event gap, and a single missed safe-stop is a cost no rate recovers. The vetted Manila team's -58% is real because it is measured where the value is: the event resolved to productive autonomy, the intervention correct, the exception taken to a safe state. Buy on events handled and you buy the right column of Figure 1; buy on cost-per-resolved-fleet-event and you buy resolution and safety — the same discipline every volume in this series keeps arriving at from a different door.

SECTION 05

Sourcing discipline: the 7-Step Vendor Vetting Framework, applied to robotics ops support

Robotics-ops diligence adds two hard requirements to every step: a per-event price is real only when the intervention-resolution accuracy behind it survives a recurring-fault audit, and only when the safe-state protocol behind it survives scripted-exception stress tests. The funnel below is representative of a 50-120-seat robotics operations-support search.

FIG. 3 – THE 7-STEP FRAMEWORK AS A ROBOTICS-OPS FUNNEL

STEP	WHAT IT ELIMINATES IN A ROBOTICS-OPS SEARCH	FIELD REMAINING
1 Requirements definition	Throughput-first scoping: fixes the intervention-resolution-accuracy floor, the uptime-restoration target, the recurrence ceiling, and the non-negotiable 100% safe-state requirement by event type	1,000+
2 Market mapping	Event mills: operations that bill event volume and treat downtime and mis-intervention as the client's problem, and generalist floors with no robotics, teleop-assist, or safe-state-protocol depth	~44
3 Capability screening	Teams without the machinery: audited resolution-accuracy history, teleop-console and fleet-management-platform proficiency, a safe-state protocol with drilled escalation, and coverage across your robot and event mix	~13
4 Compliance & security audit	Weak governance: operational-data and video protection, access controls on teleop/fleet systems, incident-reporting and duty-of-care standards, business-continuity for surge, SOC 2 scope covering the ops stack	~8
5 Operational diligence	The resolution-and-safety read: audit recurring-fault trackers for unresolved events; re-check an intervention sample against approved authority; run scripted safe-stop drills; interview on a complex perception-exception escalation	4-6
6 Competitive RFP & negotiation	Per-event pricing: finalists bid against resolution-accuracy floors, uptime-restoration targets, and the 100% safe-state standard — all carrying credits for unresolved events and any safe-state miss	2-3
7 Transition & launch governance	Cold cutover: the team calibrates against your robot types, teleop console, and safe-state protocol on a sample before it owns the live fleet, with the resolution floor and safe-state discipline certified before steady state, PITON-Global embedded buyer-side	1

Field-remaining counts represent a 50-120-seat robotics operations-support search, PITON-Global engagements 2024-26.

The standing guarantees hold: **vendor neutrality** — PITON-Global operates no support floors, handles no events, and takes no placement economics, so the shortlist reflects audited resolution and safe-state performance, not inventory; **right-sizing** — teams for whom your operation is a flagship account. Six to ten genuinely qualified providers, delivered within 48-72 hours, free to the buyer, competing through a fully transparent, fair, comprehensive, and highly competitive RFP.

SECTION 06 • ANONYMIZED CASE STUDY

Re-basing the operation on intervention-resolution accuracy: a 70-seat robotics operations desk rebuild, reconstructed

Engagement RB-091 is a US autonomous-systems operator — running a mixed fleet of warehouse and last-mile robots generating roughly 18,000,000 operations events a year (perception exceptions, stuck-robot faults, teleop-assist requests, dock failures) — that had offshored operations support to a per-event mill. The event price was excellent; the resolution and safety were not: intervention-resolution accuracy sat near 78%, robots recurred and sat idle, mean time to safe resolution had crept up, and a drill had found a

perception exception handled as a routine ticket when protocol required an immediate safe-stop. The VP of fleet operations wanted the arbitrage without the downtime and the safety exposure. Identifying details are anonymized under NDA.

SELECTION (WEEKS 0-8, RESOLUTION + SAFE-STATE READS)

Requirements fixed a 94% intervention-resolution-accuracy floor, an uptime-restoration target, a recurrence ceiling, and a non-negotiable 100% safe-state requirement. Mapping produced 44 claimants; the machinery screen — audited resolution accuracy, teleop-console/fleet-platform proficiency, drilled safe-state protocol, robot-type coverage — left 13; the compliance-and-continuity audit left 8. Recurring-fault audits, intervention re-checks, and scripted safe-stop drills shortlisted 5. A Manila team won priced against resolution and safe state, with both written into the reporting spec.

TRANSITION (MONTHS 2-7, CALIBRATED FIRST)

The team calibrated against the operator's robot types, teleop console, and safe-state protocol on a sample before owning the live fleet; the resolution floor and safe-state discipline were certified in month 3, and the safe-stop drill ran weekly from day one. The resolution-and-QA loop fed operator coaching continuously. By month 7 intervention-resolution accuracy reached 94.3%, recurring faults fell 62%, mean time to safe resolution dropped 44%, fleet-uptime contribution rose 18 points, and safe-state discipline held at 100% across every drill. PITON-Global chaired the resolution-and-safety review board to steady state.

TABLE 3 – RB-091 FIRST-YEAR VALUE BUILD-UP (US\$)		
VALUE COMPONENT	YEAR 1	BASIS
Labor arbitrage on the 70-seat desk	\$1.86M	131.3k productive hrs × (\$23.70 – \$9.50)
Fleet downtime recovered (higher resolution)	\$0.98M	Productive robot-hours restored at resolution floor
Re-intervention & truck-roll reduction	\$0.40M	Repeat interventions and field dispatch removed
Safety & incident exposure avoided	\$0.22M	Safe-state miss and incident exposure removed
Gross value created	\$3.46M	
Less: engagement & transition costs	(\$0.55M)	Calibration, safe-stop-drill build, teleop/fleet integration; advisory fee \$0 (provider-paid model)
Net value ÷ cost = first-year ROI	6.3×	\$3.46M ÷ \$0.55M

Figures rounded; resolution, downtime, and safe-state effects audit-verified. Method in Methodology & notes.

Fifty-four percent arbitrage, forty-six percent from recovered fleet downtime, reduced re-intervention, and avoided safety exposure — a typical split for the series, earned because the operation was re-based on resolution and safety rather than event volume. Every line traces to a diligence step: the resolution floor and safe-state standard to Step 1, the resolution-and-safety pricing to Step 6, the safe-stop-drill protocol to Step 3's contract. The VP's line at the year-one review: "The event price barely moved. What moved is that the robots stopped coming back — and I stopped worrying about the exception we'd handle wrong."

SECTION 07

The executive playbook: governance for the first 180 days

A robotics-ops-support transition succeeds when the team is measured and paid on intervention-resolution accuracy and safe-state discipline — client in command throughout.

DAYS 0–30

Define resolution & safe state, contract on them

Set the intervention-resolution-accuracy floor, the uptime-restoration target, the recurrence ceiling, and the non-negotiable 100% safe-state requirement with fleet-operations leadership before launch, and document the safe-state and escalation protocol by event type. Contract against resolution and safety — never per event alone — with floors carrying credits and any safe-state miss a defined breach. Stand up the recurring-fault audit and the safe-stop drill as the program's arbiters of truth.

DAYS 30–90

Calibrate, drill the safe-state protocol

Calibrate the team against your robot types, teleop console, and safe-state protocol on a sample before it owns the live fleet; certify the resolution floor and run the safe-stop drill to 100%. Switch on the resolution-and-QA loop from day one. Publish the operations dashboard: intervention-resolution accuracy, recurring-fault rate, mean time to safe resolution, fleet-uptime contribution, safe-state compliance.

DAYS 90–180

Own the fleet, certify steady state

Hand the live fleet to the team only after it holds the resolution floor and 100% safe-state discipline. Review the board monthly with the recurring-fault and safe-stop-drill results on the table. Certify steady state on two months at floor including a peak-demand or new-robot-rollout surge; hand over on documented criteria; keep the recurring-fault audit and weekly safe-stop drill standing.

THE FIVE FAILURE MODES WE ARE HIRED TO PREVENT

Paying per event while robots stay down · clearing alerts instead of resolving faults · treating a safety-critical exception like an ordinary ticket · improvising interventions beyond approved authority · owning the fleet before resolution and safe state are proven. All five are settled at selection and contract.

The robotics-ops argument, in one sentence: a handled event is activity and a resolved, safe fleet event is a robot back at work and a hazard that never reached a shared space, and a vetted Philippine team delivers –58% cost per resolved event with 94%+ intervention-resolution accuracy, recurring faults cut by nearly two-thirds, and 100% safe-state discipline — for buyers who audit resolution and drill safe-state instead of counting events handled, and compete the finalists through a fully transparent, fair, comprehensive, and highly competitive RFP. Anyone can handle an event. We make sure you buy the desk that resolves the fault and takes the exception to a safe state.

METHODOLOGY & NOTES

How the numbers were built

Resolution and safety figures (Fig. 1, Table 2) derive from engagement instrumentation in PITON-Global robotics-operations engagements, 2025–26. Intervention-resolution accuracy is measured against the recurring-fault tracker; safe-state compliance by scripted-exception drills; recurring-fault rate, mean time to safe resolution, and fleet-uptime contribution against the client's pre-engagement baseline. The weak-provider column is a composite of pre-engagement vendor reporting reviewed in diligence, shown for contrast.

Cost-per-resolved-fleet-event figures (Table 1) are fully loaded — wages, benefits and statutory charges, facilities, technology and teleop/fleet-platform tooling, management and QA overhead including safe-stop-drill leads, and attrition-driven recruiting — divided by events resolved to productive autonomy, clean, and safely, with unresolved, recurring, or mis-handled events excluded from the denominator; US comparators reflect fully-loaded in-house cost on the same basis. A correctly-resolved fleet event returns the robot to productive autonomy, is documented clean, and — where safety-critical — is taken to the operator's engineering-approved safe state.

The case study (RB-091) is anonymized under NDA; volumes and dates are generalized, figures rounded. Resolution, downtime, and safe-state effects are audit-verified; the downtime-recovered line reflects restored productive robot-hours, and the exposure-avoided line is a conservative estimate. ROI = net first-year value ÷ all engagement-related client costs. PITON-Global's advisory fee is provider-paid and appears at \$0 in the client cost base; neutrality safeguards are documented at piton-global.com.

Scope and market context. This paper concerns human operations support around autonomous systems — monitoring, teleoperation-assist, fault resolution, and safe-state triage — and is not engineering, functional-safety-certification, or regulatory advice; safe-state protocols and intervention authority are always operated to the fleet operator's own engineering-approved specifications. Context draws on IBPAP reporting and PITON-Global's proprietary provider mapping (1,000+ operations; resolution and safe-state performance re-verified May 2026). Estimates and projections are PITON-Global analysis and should be cited as such. The full series is available at piton-global.com.



Would your provider's event price survive a resolution-and-safe-state audit?

Thirty minutes with John will tell you. Free to buyers, strictly vendor-neutral — a resolution-and-safe-state-verified shortlist within two to three business days.

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