

### A ranked, explainable view of the parts most likely to ground an aircraft next across DemoAir Regional — and the specific action to take on each, before it happens.

**Demo data notice.** This sample uses real public aviation data sources (FAA SDR, FAA Registry, BTS On-Time, NASA ASRS) combined with synthetic private airline/MRO data for a fictional operator, DemoAir Regional. It demonstrates the workflow and deliverable — it is not based on a real operator and must not be used for operational aviation decisions.

AOG Shield is a decision-support and risk-advisory system. It does not determine airworthiness, guarantee AOG prevention, certify regulatory compliance, approve parts for installation, or replace human maintenance, quality, or planning review. Every airworthiness and compliance decision is made by the operator's certified personnel.

#### 01 Executive summary



AOG Shield reviewed **45** aircraft, **10** stations, **900** parts, and **5,000** work orders against **600** historical AOG events and **16** suppliers. It produced **124** prioritized recommendations that collapse to **39** distinct part/station risks, of which **13** are high-priority. The leading drivers are local stockouts of No-Go (EC-1) parts, long supplier lead times, repeated related write-ups, and certificate/traceability gaps. The single highest-priority advisory is below; the full ranked list follows in Section 2.

**Illustrative exposure.** The #1 advisory alone carries  $\approx 25$  delay-hours of AOG exposure. At the published industry benchmark of **\$10,000–\$150,000 per AOG hour** (Boeing; IATA),<sup>1</sup> that is roughly **\$0.3M–\$3.8M** of avoidable risk on a single event — before crew, compensation, and wet-lease knock-on costs. Avoiding even a few flagged events offsets the program many times over. *Figures are industry benchmarks applied to synthetic demo data, not a quoted result.*

#### PRIORITY #1 ADVISORY · CONFIDENCE: MEDIUM

### TR Control Unit PN-78-00108

**71.8 HIGH**

Station **ATL** · 8 aircraft affected

#### RECOMMENDED ACTION

**Trigger supplier quality review for PN-78-00108 and shift AOG buys away from unstable vendors.**

**Expected impact:** Reduces late delivery and certificate failure risk during AOG response.

#### WHY THIS ADVISORY

- Local serviceable quantity at ATL is 0.
- Part lead time is 33 days with current demand pressure.
- Documentation risk score is 45.0; supplier issue pressure is 0.25.

Decision-support only — human maintenance, quality, and planning review required before action.

#### NETWORK READINESS INDICATORS

**77**

CRITICAL PARTS IN STOCKOUT

**28d**

AVG CRITICAL-PART LEAD TIME

**14/16**

SUPPLIERS BELOW 90% ON-TIME

**25**

NO-GO (EC-1) PARTS FLAGGED

**How to read this report.** Each item is scored 0–100 and banded: **Critical ≥80** · **High 65–79** · **Medium 45–64** · **Low <45**. Part criticality is mapped to MEL dispatch impact — **No-Go (EC-1)**, **Go-If (EC-2)**, **Go (EC-3)** — an interpretive mapping for prioritization, not an airworthiness determination. Parts are also flagged **Rotable** (repair / exchange / pool) or **Consumable** (reorder), which steers the recommended sourcing action.

## 02 Top recommended actions

De-duplicated to one advisory per part & station (the 39 distinct risks ranked), with the action to take, the number of tails affected, model confidence, and whether human review is flagged.

#	RISK	SCORE	PART #	PART	STN	TAILS	RECOMMENDED ACTION	CONF.	REVIEW
1	HIGH	71.8	PN-78-00108	TR Control Unit	ATL	8	Trigger supplier quality review for PN-78-00108 and shift AOG buys away from unstable vendors.	Medium	REVIEW
2	HIGH	71.4	PN-27-00162	Position Sensor	LGA	7	Quarantine PN-27-00162 at LGA pending documentation review.	Medium	No
3	HIGH	70.7	PN-78-00108	TR Control Unit	RDU	6	Review certificate and trace records for PN-78-00108 before use, transfer, or sourcing decision.	Medium	REVIEW
4	HIGH	70.5	PN-78-00078	Thrust Reverser Actuator	RDU	6	Transfer 1 PN-78-00078 from CLT to RDU before aircraft arrival.	Medium	No
5	HIGH	70.4	PN-78-00078	Thrust Reverser Actuator	LGA	7	Transfer 1 PN-78-00078 from CLT to LGA before aircraft arrival.	Medium	No
6	HIGH	70.1	PN-78-00078	Thrust Reverser Actuator	PIT	4	Transfer 1 PN-78-00078 from CLT to PIT before aircraft arrival.	Medium	No
7	MEDIUM	68.9	PN-78-00078	Thrust Reverser Actuator	DTW	5	Transfer 1 PN-78-00078 from CLT to DTW before aircraft arrival.	Medium	No
8	MEDIUM	68.3	PN-78-00108	TR Control Unit	LGA	7	Arrange borrow/exchange for PN-78-00108 from PIT with return plan after replenishment.	Medium	No
9	MEDIUM	68.1	PN-78-00108	TR Control Unit	DCA	2	Arrange borrow/exchange for PN-78-00108 from PIT with return plan after replenishment.	Medium	No
10	MEDIUM	68.1	PN-78-00108	TR Control Unit	BOS	4	Arrange borrow/exchange for PN-78-00108 from PIT with return plan after replenishment.	Medium	No

## 03

## Highest-risk aircraft

TAIL	TYPE	NEXT STN	RECENT WOS	HIST. AOG	DELAY HRS	TOP RELATED PARTS	SCORE	RECOMMENDED ACTION
N104DA	E175	ATL	16	24	567	PN-34-00765, PN-49-00782, PN-34-00703	86.3	Review top-risk part coverage at next station
N120DA	E175	LGA	18	20	397	PN-27-00601, PN-32-00437, PN-27-00639	70.2	Review top-risk part coverage at next station
N107DA	E175	PIT	7	25	434	PN-74-00557, PN-29-00844, PN-78-00047	67.1	Continue monitoring
N103DA	E175	JFK	10	17	350	PN-32-00307, PN-28-00270, PN-21-00001	60.9	Continue monitoring
N109DA	E175	ORD	23	15	328	PN-26-00569, PN-28-00287, PN-28-00200	59.1	Continue monitoring
N122DA	E175	ATL	12	16	317	PN-32-00265, PN-49-00596, PN-26-00854	58.4	Continue monitoring
N139DA	E175	ATL	8	15	396	PN-28-00439, PN-34-00787, PN-24-00464	56.8	Continue monitoring
N140DA	E175	RDU	8	14	543	PN-21-00804, PN-28-00582, PN-21-00466	55.8	Continue monitoring
N134DA	E175	RDU	7	20	315	PN-52-00070, PN-27-00639, PN-32-00408	55.5	Continue monitoring
N118DA	E175	LGA	17	14	290	PN-49-00782, PN-36-00704, PN-26-00769	54.6	Continue monitoring

## 04

## Highest-risk stations

STN	CITY	MAINT.	MISSING CRITICAL	AOG	DELAY HRS	SCORE	GUIDANCE
RDU	Raleigh	line	291	19	637	78.8	Review high-stock hubs for pre-position transfer
LGA	New York	line	293	26	468	77.3	Review high-stock hubs for pre-position transfer
BOS	Boston	line	297	26	411	75.1	Review high-stock hubs for pre-position transfer
PIT	Pittsburgh	line	309	19	532	74.3	Review high-stock hubs for pre-position transfer
DTW	Detroit	line	301	18	297	63.2	Review high-stock hubs for pre-position transfer
DCA	Washington	line	299	11	263	38.5	Review high-stock hubs for pre-position transfer

STN	CITY	MAINT.	MISSING CRITICAL	AOG	DELAY HRS	SCORE	GUIDANCE
ORD	Chicago	heavy	136	11	281	18.9	Review high-stock hubs for pre-position transfer
CLT	Charlotte	heavy	140	7	165	14.9	Review high-stock hubs for pre-position transfer
ATL	Atlanta	heavy	128	6	71	14.8	Review high-stock hubs for pre-position transfer
JFK	New York	heavy	133	6	122	9.1	Review high-stock hubs for pre-position transfer

## 05 Highest-risk parts

PART #	PART	ATA	DISPATCH IMPACT	CLASS	SVC QTY	STNS @0	LEAD (D)	AOG	CERT RATE	SCORE	GUIDANCE
PN-26-00492	Extinguisher Bottle	26	NO-GO · EC-1	ROTABLE	1	9	37	5	100%	78.3	Increase min stock and evaluate transfer candidates
PN-27-00162	Position Sensor	27	NO-GO · EC-1	CONSUMABLE	8	6	28	9	92%	71.8	Increase min stock and evaluate transfer candidates
PN-78-00108	TR Control Unit	78	NO-GO · EC-1	ROTABLE	5	8	33	8	69%	67.4	Increase min stock and evaluate transfer candidates
PN-49-00822	APU Igniter	49	NO-GO · EC-1	CONSUMABLE	1	9	37	6	67%	65.3	Increase min stock and evaluate transfer candidates
PN-78-00078	Thrust Reverser Actuator	78	NO-GO · EC-1	ROTABLE	6	7	28	8	83%	62.4	Increase min stock and evaluate transfer candidates
PN-24-00802	Generator Control Unit	24	NO-GO · EC-1	ROTABLE	5	7	34	2	75%	60.8	Increase min stock and evaluate transfer candidates
PN-27-00639		27	NO-GO · EC-1	ROTABLE	1	9	37	1	86%	60.8	Increase min stock

PART #	PART	ATA	DISPATCH IMPACT	CLASS	SVC QTY	STNS @0	LEAD (D)	AOG	CERT RATE	SCORE	GUIDANCE
	Spoiler Control Module										and evaluate transfer candidates
PN-21-00804	Air Cycle Machine	21	GO-IF · EC-2	ROTABLE	3	8	8	8	75%	60.5	Increase min stock and evaluate transfer candidates
PN-22-00595	Mode Control Panel	22	NO-GO · EC-1	ROTABLE	5	7	27	5	86%	58.3	Increase min stock and evaluate transfer candidates
PN-73-00297	Fuel Nozzle	73	NO-GO · EC-1	CONSUMABLE	8	7	29	6	80%	58.0	Increase min stock and evaluate transfer candidates

## 06 Supplier reliability risks

SUPPLIER	QUOTE RESP (H)	ON-TIME	AVG LATE (H)	CERT AVAIL	SCORE	STATUS
Precision Rotables	9.1	57%	41.7	96%	84.8	AVOID FOR AOG-CRITICAL
AeroTrace Materials	9.3	62%	38.4	94%	82.0	AVOID FOR AOG-CRITICAL
Avionics Direct	3.5	62%	39.3	92%	79.7	AVOID FOR AOG-CRITICAL
Summit Air Spares	8.3	64%	33.9	93%	75.4	AVOID FOR AOG-CRITICAL
MetroJet Spares	5.9	62%	36.9	97%	68.1	USE WITH REVIEW
Vector MRO Supply	10.9	70%	29.5	97%	63.9	USE WITH REVIEW
AeroCore Supply	3.2	70%	28.3	92%	61.7	USE WITH REVIEW
JetLine Parts	8.1	70%	27.9	96%	61.2	USE WITH REVIEW
Global USM Partners	11.9	78%	21.6	96%	54.4	USE WITH REVIEW
BlueRamp Aero	9.4	74%	23.9	100%	49.4	USE WITH REVIEW

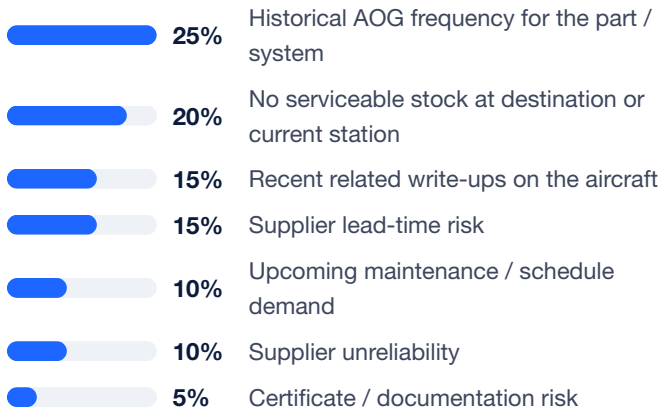
## 07 Certificate & traceability gaps

PART #	SERIAL	STN	CERT TYPE	CERT AVAIL	TRACE	EXPIRES	DOC RISK	RECOMMENDED ACTION
PN-21-00568	SN876683	S008	FAA 8130-3	NO	MISSING	2028-10-29	70	Quarantine pending documentation review

PART #	SERIAL	STN	CERT TYPE	CERT AVAIL	TRACE	EXPIRES	DOC RISK	RECOMMENDED ACTION
PN-78-00443	SN731426	S001	FAA 8130-3	NO	MISSING	2027-11-13	70	Quarantine pending documentation review
PN-21-00744	SN497960	S009	FAA 8130-3	NO	MISSING	2028-08-15	70	Quarantine pending documentation review
PN-49-00326	SN161183	S009	FAA 8130-3	NO	MISSING	2029-05-12	70	Quarantine pending documentation review
PN-21-00334	SN435897	S009	FAA 8130-3	NO	MISSING	2029-04-20	70	Quarantine pending documentation review
PN-74-00545	SN255513	S005	EASA Form 1	NO	MISSING	2029-04-10	70	Quarantine pending documentation review
PN-27-00763	SN856558	S005	FAA 8130-3	NO	MISSING	2028-10-02	70	Quarantine pending documentation review
PN-52-00521	SN535349	S007	OEM COC	NO	MISSING	2029-02-02	70	Quarantine pending documentation review
PN-27-00630	SN543177	S005	EASA Form 1	NO	MISSING	2027-02-14	70	Quarantine pending documentation review
PN-78-00656	SN975794	S010	EASA Form 1	NO	MISSING	2028-10-15	70	Quarantine pending documentation review

## 08 How the risk score is calculated

Every score is a transparent, deterministic weighting — never a black box. The model encodes a likelihood×impact view of AOG risk; each component is shown so the result can be audited.



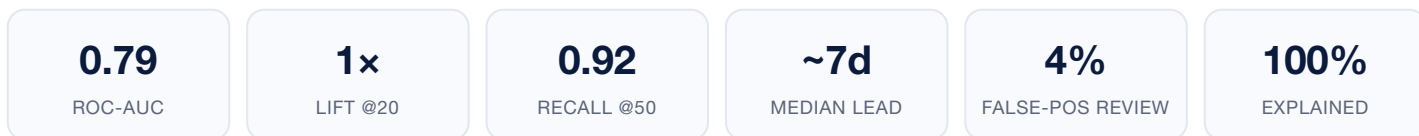
**WORKED EXAMPLE — THE #1 ADVISORY**

**TR Control Unit PN-78-00108 — ATA 78 · NO-GO · EC-1**  
**ROTABLE** — at **ATL** (8 aircraft affected). The same weighted factors above, mapped to this advisory's observed signals:

WEIGHT	FACTOR	OBSERVED SIGNAL (FROM DATA)
25%	Historical AOG frequency	8 AOG events on this part in 365 days
20%	No serviceable stock at point of demand	0 serviceable at ATL; 8 of 10 stations at zero stock
15%	Recent related write-ups	3 related work orders in last 90 days
15%	Supplier lead-time risk	33-day average lead time
10%	Upcoming schedule demand	maintenance / route demand over the prediction horizon
10%	Supplier reliability	issue pressure present in the qualified sourcing channel
5%	Certificate / documentation	69% certificate availability network-wide

Composite risk score **71.8 HIGH** · confidence Medium.

**09 Validation & method transparency**



**Synthetic-label metrics only — not a real-world accuracy claim.** These are measured against synthetic historical AOG labels for DemoAir Regional over a 14-day horizon (78 candidate risks, 12 known events). They demonstrate ranking behavior and workflow validity. A paid pilot validates these numbers against your own AOG history: of the AOGs you actually had, how many we would have flagged, and how early.

**10 Data sources & limitations**

DATA SOURCE	TYPE	USED FOR	LIMITATION
FAA SDR	Public	Failure-pattern weighting	Not operator-specific inventory truth
BTS On-Time	Public	Station / schedule realism	Delay cause may not identify parts
FAA Registry	Public	Aircraft model / reference realism	Does not show operator inventory
NASA ASRS	Public narrative	Explanation language	Voluntary; not verified by NASA
Synthetic private data	Simulated	Full workflow demonstration	Not real customer data

## 11 How to run this on your own fleet

The diagnostic runs offline on anonymized exports — tail numbers, supplier/employee/customer names, and prices can all be masked. No integration required to start. Typical exports:

aircraft.csv	aog_events.csv
stations.csv	supplier_quotes.csv
parts_master.csv	purchase_orders.csv
inventory.csv	certificates.csv
work_orders.csv	aircraft_schedule.csv

1. Review this sample report.
2. Agree on an anonymized data-export schema.
3. Run one offline diagnostic on 6–12 months of history.
4. Validate the top recommendations with your maintenance & materials experts.
5. Backtest recommendations against historical AOG / urgent-order outcomes.
6. Decide whether to proceed to a recurring readiness service.

**Request a diagnostic:** [eltonc@ashesystem.com](mailto:eltonc@ashesystem.com) · [ashesystem.com](https://ashesystem.com)

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**References.**<sup>1</sup> AOG cost benchmarks are industry estimates, not Ashe System figures: \$10,000–\$150,000 per AOG hour and the ~\$60B / ~8%-of-revenue annual flight-disruption figure (Boeing, cited; IATA *Reviving the Commercial Aircraft Supply Chain*, 2025) — see StartPac ([startpac.com/blog/aircraft-on-ground](https://startpac.com/blog/aircraft-on-ground)); single-day AOG event cost of \$50,000–\$150,000 per Air Cargo Week ([aircargoweek.com/the-real-cost-of-aog](https://aircargoweek.com/the-real-cost-of-aog)). Materials KPI conventions (fill rate, stockout rate, supplier on-time, lead time) per standard MRO/inventory practice; piece-part availability as the leading TAT driver per Oliver Wyman MRO Survey (2025). MEL essentiality codes (EC-1/2/3) per FAA AC 120-MEL and MMEL convention. Benchmarks are applied to synthetic demo data for illustration only.

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