A photograph of a modern building with a large glass facade and a prominent white, curved architectural element. The building is set against a clear blue sky. The text "Safety Management: Theory to Practice" is overlaid on the bottom right of the image.

Safety Management: Theory to Practice

An aerial photograph of a runway at sunset. The sky is filled with soft, golden clouds, and the runway surface is visible in the lower right corner, receding into the distance.

BFGoodrich

Aerospace

Safety Management

Safety Assessment Tools, Data Analysis,
and Information Feed-Back

William Ashworth - General Manager
Aircraft Modification Services Division

Tim Killion - Quality Liaison
Airframe Services Division

BFG Flight Safety Program

- **Developed in 1997, the program introduced HF into the 3rd party maintenance organization.**
 - **Move from “Blame and Train” to a structured process of review, training, and oversight.**
 - **The programs success is keyed on recognizing that mistakes are normal, and that the error reduction process should always focus on factors that contribute to maintenance errors.**

Creating Program Definition

- **Development and support of HF programs by Senior management.**
- **Acceptance and promotion by mid-management**
- **Active participation by all members of the organization**
 - **Investigation**
 - **Data Analysis**
 - **Corrective Action**
- **Measurement**
- **Feedback / Training**

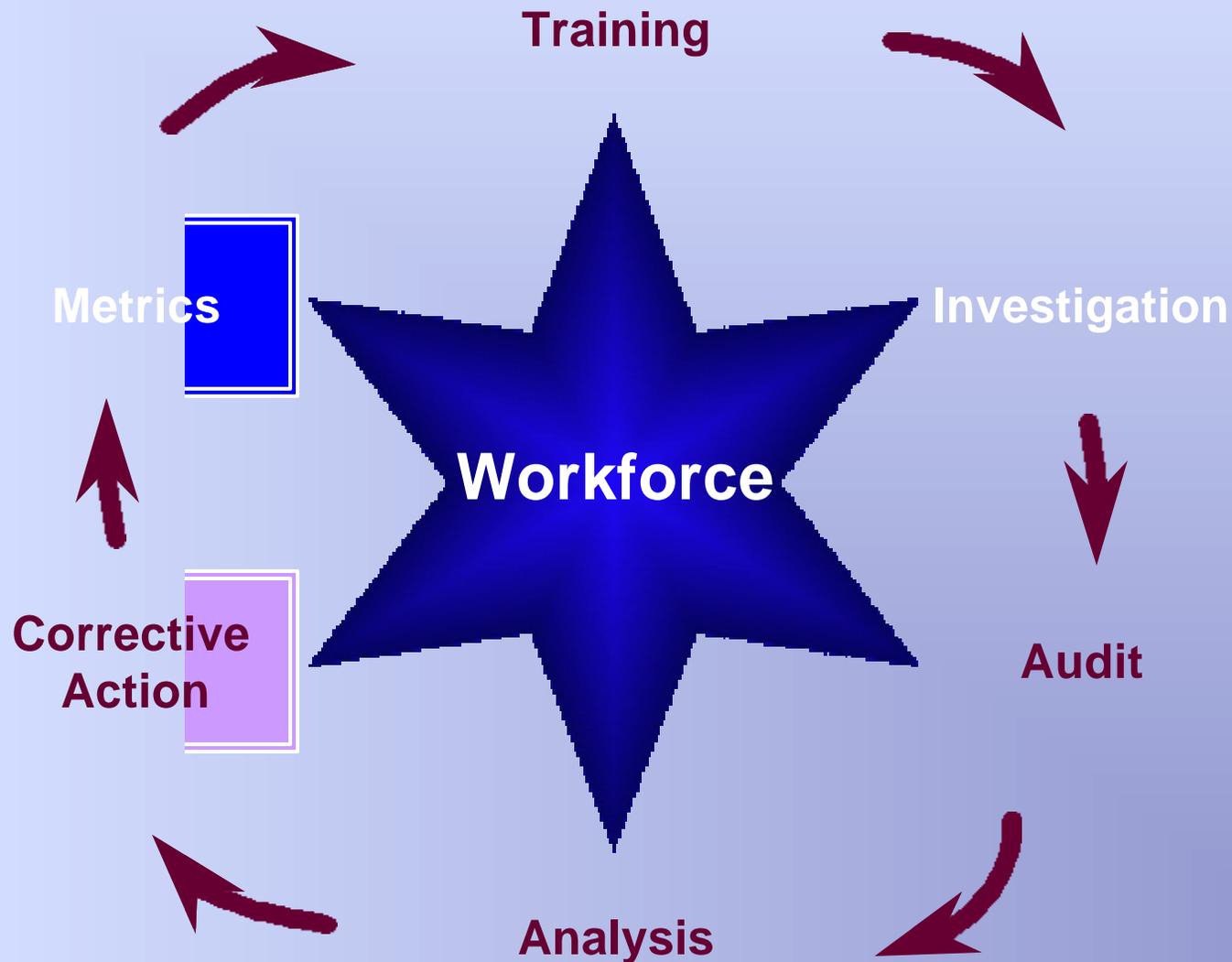
Define an Error Threshold

- **Determine Threshold for Errors Requiring Investigation.**
 - **Avoid low thresholds of investigations at first.**
 - **Standard Focus:**
 - **Regulatory Compliance**
 - **Aircarrier General Maintenance Procedures**
 - **CASE Audit Standards**
 - **Standard Maintenance Practices**

Work Force Involvement

- Encourage reporting of errors
- Investigations are conducted with the participation of the general workforce
- Corrective actions are developed through collective ideas from workforce
- Operational/Follow-up audits are staffed utilizing workforce/QC/QA personnel

HF / Error Reduction Processes



Investigation

- **Don't Try to Become a human Factors Expert**
- **Structured Investigations**
 - **Use of MEDA investigation format for standard questioning.**
 - **Continue to ask “WHY”**
 - **Focus on the identification of contributing factors**
 - **Disciplinary action**

Audit

- **Ongoing investigations focused on the specifics of the error**
- **Through structured review processes, an awareness of the error is maintained**
 - **Follow-up Audit**
 - **System Evaluations**
 - **FAA Checklist Audit**

Analysis

- **Validation process to determine the extent and level of error**
 - **Survey similar areas of the organization**
 - **Review current policies/procedures**
 - **Customer Feedback**
- **Determine whether findings are isolated or actual symptoms of technical, policy, procedural, or managerial problems**

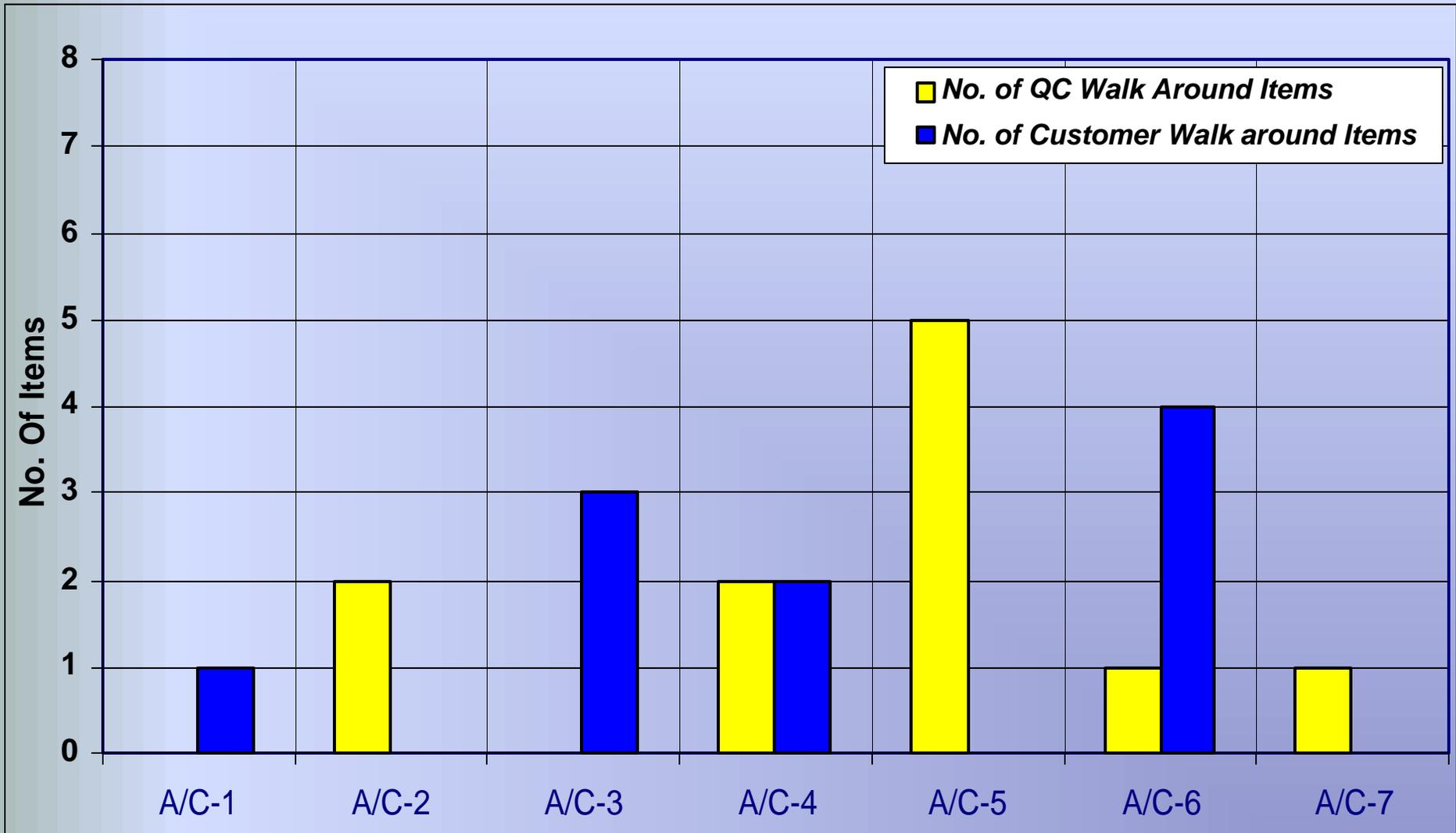
Corrective Action

- **Prevention Strategies and Controls**
 - **Focus on the identified contributing factors**
 - **Avoid “Blame and Train”**
 - **Proposed corrective actions must be measurable**
 - **How will it be know if it works?**
 - **Workforce participation in developing corrective action plan**

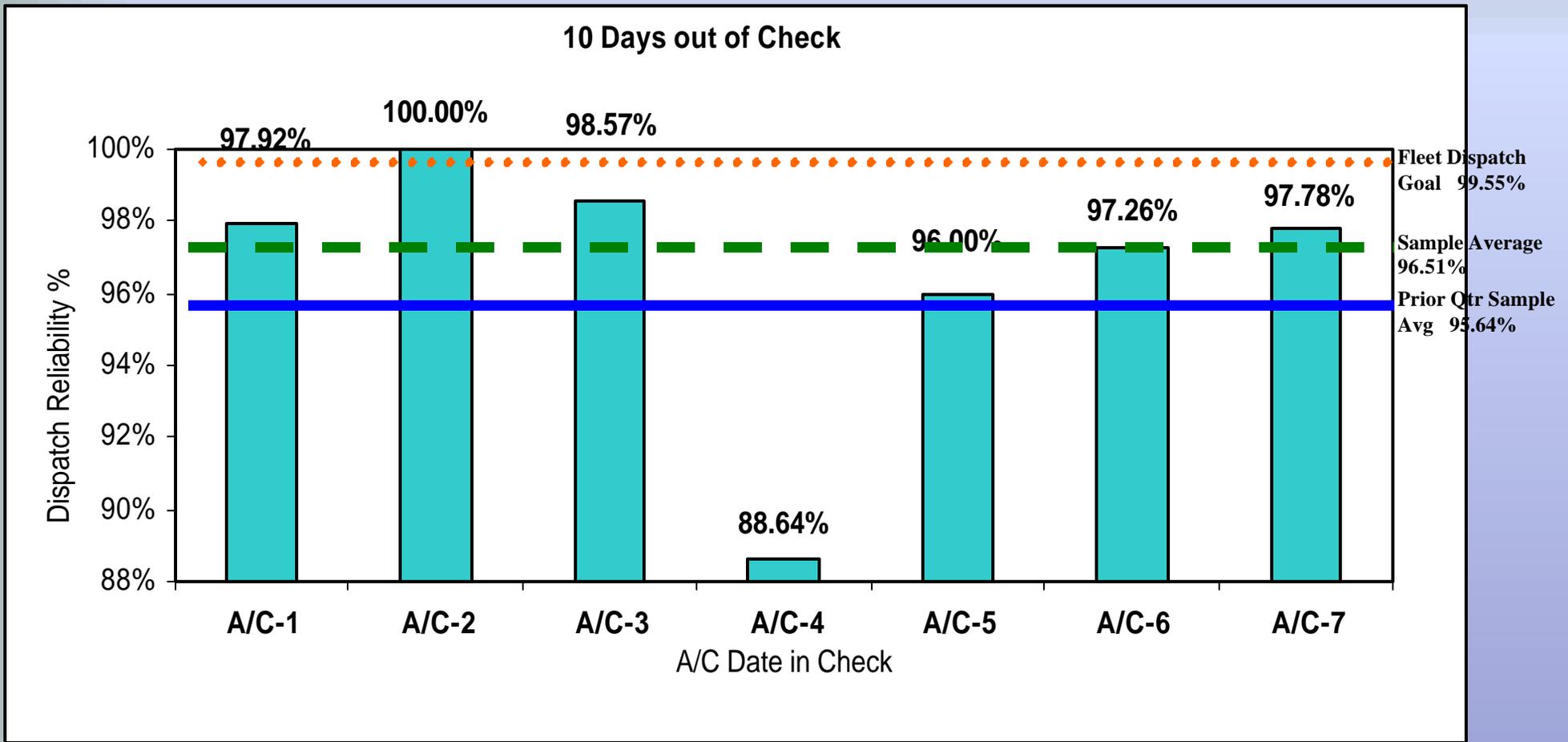
Metrics

- **Performance Analysis**
 - **Follow-up audits**
 - **Pre-delivery discrepancies**
 - **Records accuracy tracking**
 - **QC task rejections**
 - **Customer feedback**
 - **Post delivery discrepancies**
 - **Dispatch reliability data**

Pre-Delivery Metrics



Post Delivery Metrics



A/C	A/C-1	A/C-2	A/C-3	A/C-4	A/C-5	A/C-6	A/C-7
Dispatch Reliability	97.92%	100.00%	98.57%	88.64%	96.00%	97.26%	97.78%
Scheduled Departures	96	81	70	79	75	73	90
Delays	2	0	1	1	3	2	2
Cancel	0	0	0	9	0	0	0

DATA BASE DEMO

Flight Safety DataBase



BF Goodrich

MEDA FORM	SEDA FORM	
MEDA Browser	SEDA Browser	
		
Follow-Up Screen	AUDIT	DataBaseAdmin
Reports Browser	Analysis Screen	EXIT DATABASE

MEDA 1.2

BFGoodrich**Aerospace**

Airframe Services Division

ERROR DECISION AID

ERROR DETAIL REPORT

REPORT CRITERIA:**Airline**

Aircraft 737

Tail Number

ATA # 27-00

Evaluator

ML / Department

Error Type

1. Improper Installation***Wrong Equipment / Part Installed***

Meda # 250 Wrong attaching hardware installed on LH Aileron Trim Tab.

Incomplete Installation

Meda # 40 Bolt for Fail-safe link for the #8 flap carriage was left loose.

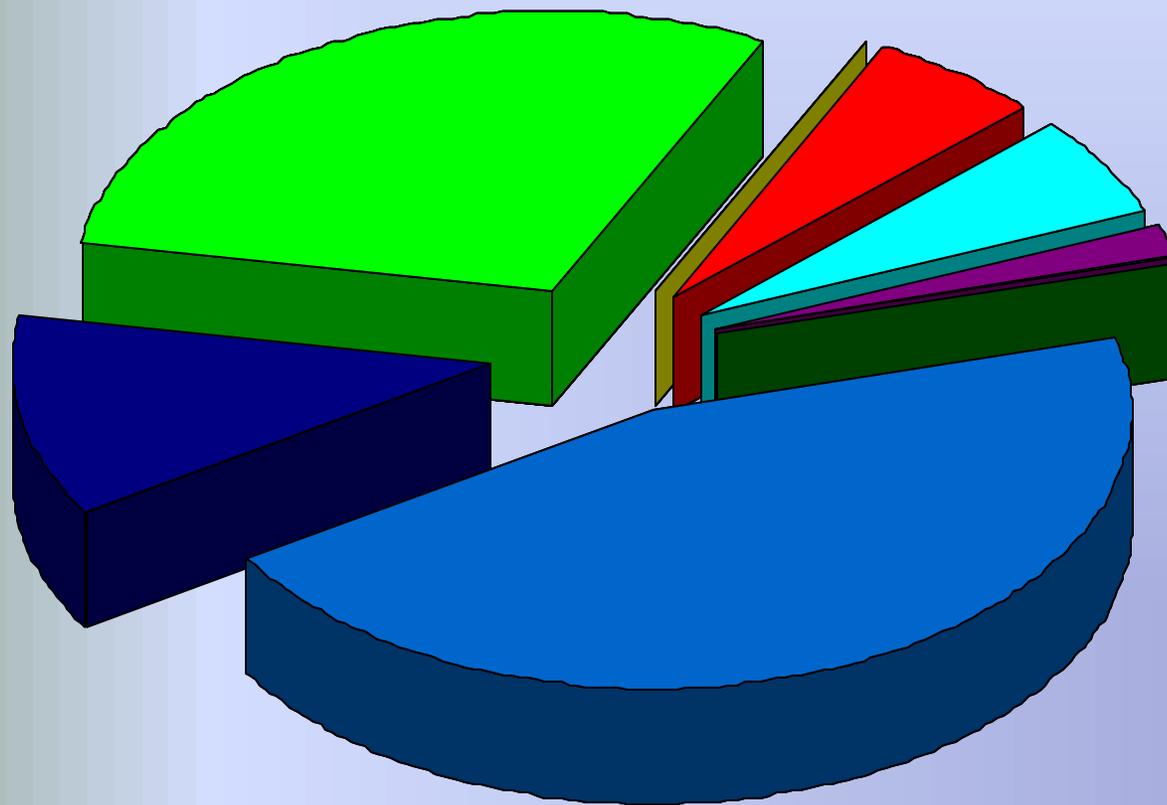
MEDA Database Metrics

Maintenance Error

	Improper Installation		Improper Servicing		Improper/Incomplete Repair		Improper Fault Isolation/Inspection/Testing		Actions Causing Foreign Object Damage		Actions Causing Equipment Damage		Actions Causing Personal Injury		Other		Total	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
Information	38	22	1		7	4	13	3	2		2	1	3	3	37	11	103	44
Equipment/Tools/Parts	18	5		1	2		4	2			13	1	30	40	6	3	73	52
Airplane Design/Configuration	2	4			1		2		1	1	1		2	6			9	11
Job/Task	14	15			3	3	4	3		1	1		24	23	3	6	49	51
Technical Knowledge/Skills	15	6	1		6	6	7	1			2	1	5	5	3	1	39	20
Factors Affecting Individual Performance	13	3			1	2	1	2		1	3		30	17	1	1	49	26
Environment/Facilities	6	1	1						1	1	3	1	15	9		2	26	14
Organizational Environment Issues	7	6			4	1	8				3		1	1	2	1	25	9
Leadership Supervision	3	7			5	2	7	3			2	2	7	9	5	4	29	27
Communication Issues	21	11	1		8	4	6	2			4	2	3	9	8	12	51	40
Other Issues	4	2				1	2			2				2	2	8	10	15
Total	141	82	4	1	37	23	54	16	4	6	36	8	120	124	67	49	463	309

Contributing Factors

Metric Breakdown



Contributing Factor:
Job / Task Error Breakdown

- Improper Installation
- Improper Servicing
- Improper/Incomplete Repair
- Improper Fault Isolation/Inspection/Testing
- Actions Causing FOD
- Actions Causing Equipment Damage
- Actions Causing Personal Injury
- Other

Training

- **Specialized Feedback / Training based upon post delivery metrics, investigation results, and audit findings**
- **MRM/Human Factors Training**
- **FAA / Repair Station regulation and policy reviews**
- **Maintenance Error Investigator Training**



- **A positive change in culture**
 - **Enhanced communications**
 - **Experience levels increase**
 - **Reinforces management commitment**
 - **Reinforces positive change can be effected by the workforce.**
- **Participation in program reviews**
 - **Quality Review Teams evaluate program data**
 - **Share customer program metrics**
- **Program Champion**

Continuous Improvement

- **Participation in industry forums**
 - Keep up with new developments
- **Communication:**
 - **Customers / Workforce / FAA / OEM**
 - Enhance methods of sharing program data
 - Work to eliminate the enforcement action fear
 - Reinforce the commitment towards safety



-Orville Wright
on the future of aviation

What's Next?