

# Practical Application of Internal Evaluation Programs

Presented at the Aviation Human  
Factors & SMS Seminar III, Dallas  
Texas, March 2011

Steven C. McNeely

- Objective:
  - To provide some practical application information that may be useful to you when developing and implementing an Internal Evaluation Program (IEP).

# Overview

- Define what an IEP is.
- Why implement an IEP - what can an IEP do for you?
- How much does an IEP cost?
- Organizational/Functional Structure considerations.
- How does an IEP work?

# Definition on an IEP

## ➤ AC120-59:

➤ An IEP is a fundamental element to ensure compliance with external regulator requirements, identify nonconformance to internal company policies and procedures, and identify opportunities to improve organizational policies, procedures, and processes.

➤ An IEP is a high level voluntary program that provides the operator with a means to maintain and refine the management system by continually monitoring the effectiveness and efficiency of processes and systems.

# Definition on an IEP

➤ FAA SMS Framework, Rev 2, 06/26/09 - Component 3.0 Safety Assurance, element 3.1:

➤ The organization will monitor, measure, and evaluate the performance and effectiveness of risk controls to:

➤ Monitor their systems and operations to:

➤ Identify new hazards

➤ Measure the effectiveness of safety risk controls

➤ Ensure compliance with regulatory requirements applicable to the SMS, and

➤ Ensure the safety assurance function is based upon a comprehensive plan

➤ Collect data necessary to demonstrate effectiveness of:

➤ Operational processes

➤ SMS

# Definition on an IEP

Monitoring and measurement of business functions / departments as a principle of management practices was first penned in 1898 by Henry Foyal as one of the 14 principles of management.

# Therefore

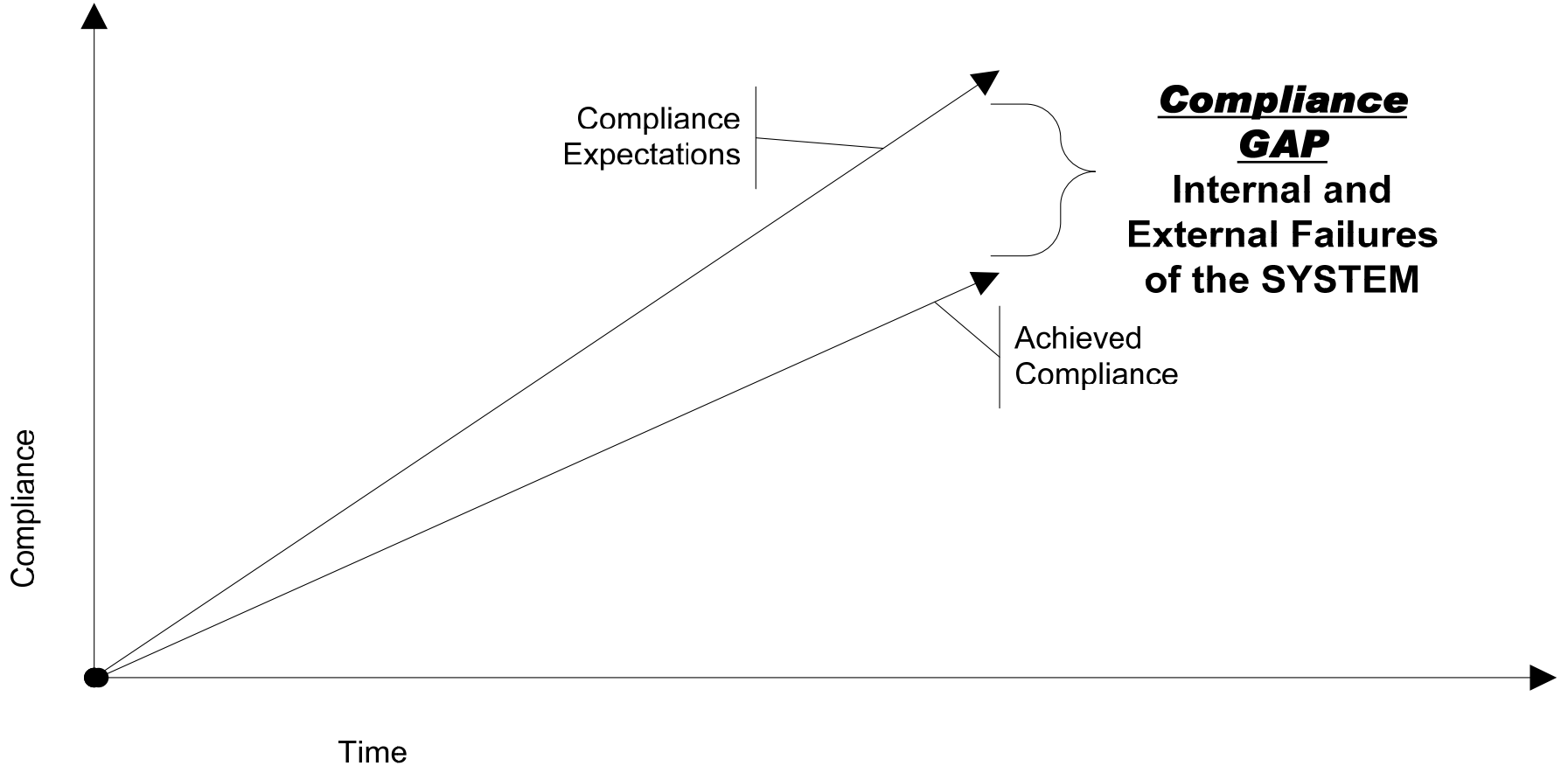
- An operational definition of an IEP:
  - A component piece of the Safety Assurance attribute of an SMS
  - A management information system, used by management to monitor operations and make decisions
  - A system for measuring and monitoring to ensure compliance and assurance for the regulatory, safety, and quality of the operational departments.

# What an IEP is not

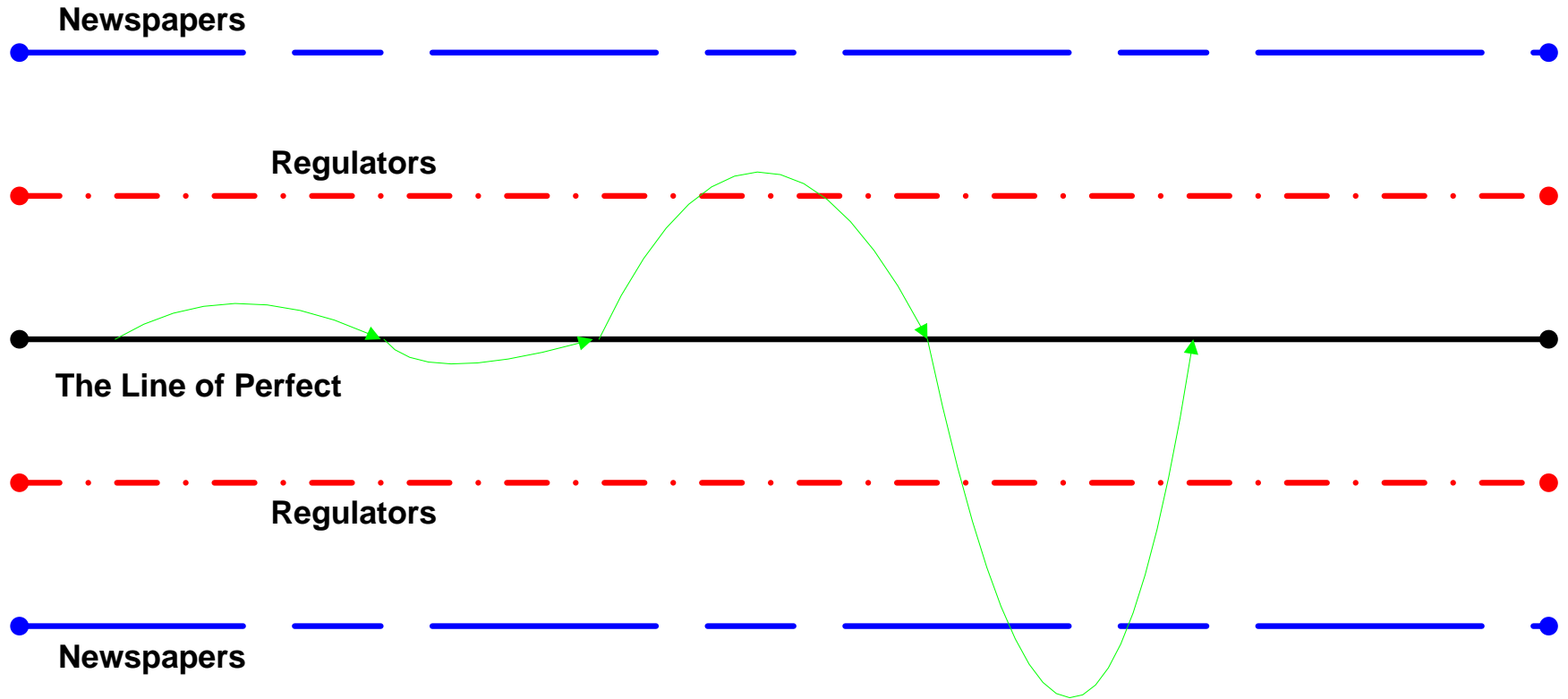
- Is not a replacement for other required programs such as CAS.
- WHY? – CONTEXT!
- Required systems like CAS only measure specific information about specific programs, i.e. performance and effectiveness of the inspection and maintenance program the aircraft are maintained under.
- An IEP should measure all departments, programs, processes, etc....



# Why Implement an IEP?



# Why Implement an IEP?



# What can an IEP do for you?

➤ Monitor the operation(s) to identify variances from the expected performance levels, measure the impact (severity) of variances, assess the associated risk of variances, and develop action plans to correct variance to bring the operation(s) into compliance with the expected performance levels; reducing the costs associated with internal and external failures in the operation(s).

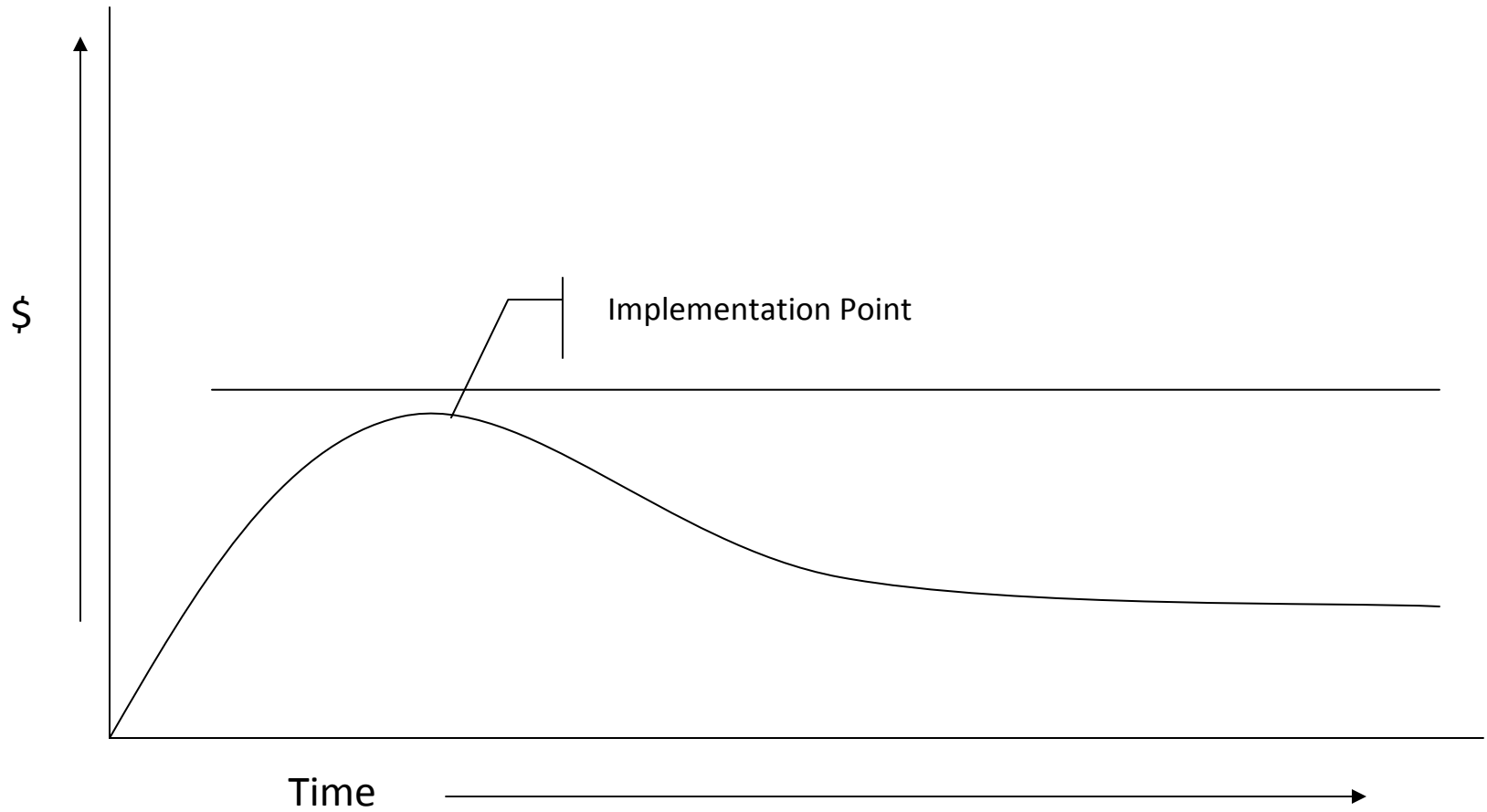
# How much does an IEP cost?

- All programs have associated costs.
- Normally referred to as allocation of resources.
- Your IEP will likely be developed around what is termed available resources.

# How much does an IEP cost?

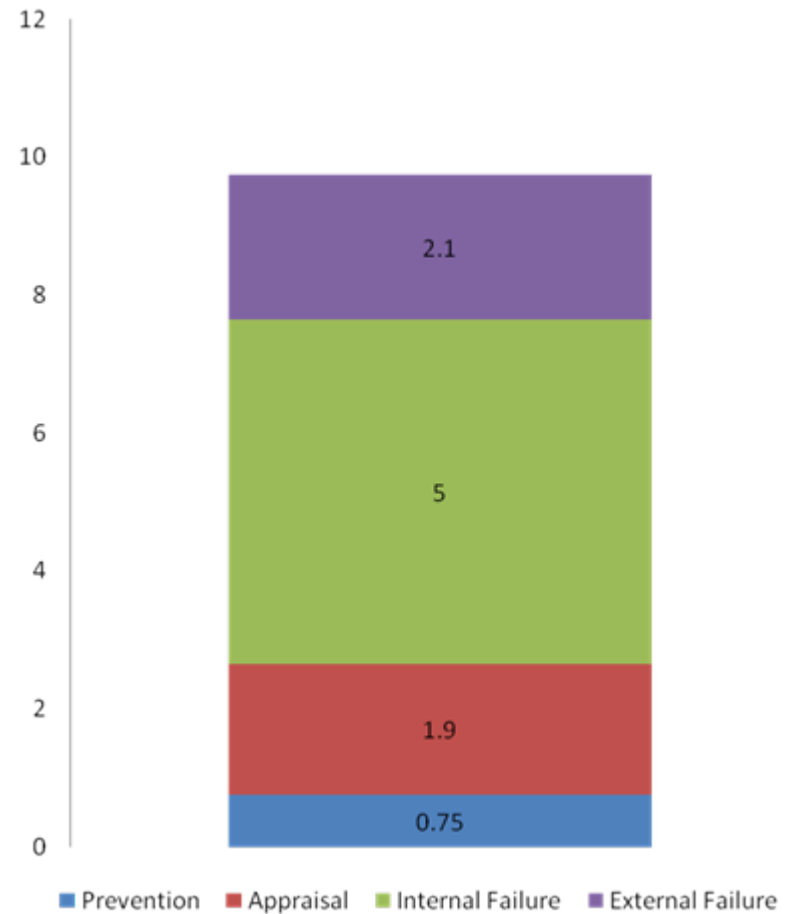
- What do I mean by available resources?
- Those existing resources you already have that can be reassigned or redistributed.
  - This includes labor and time resources as well as budget allocation.
- Most smaller organizations will likely not hire/purchase new resources.

# Implementation Cost Curve



# Activity Based Costing

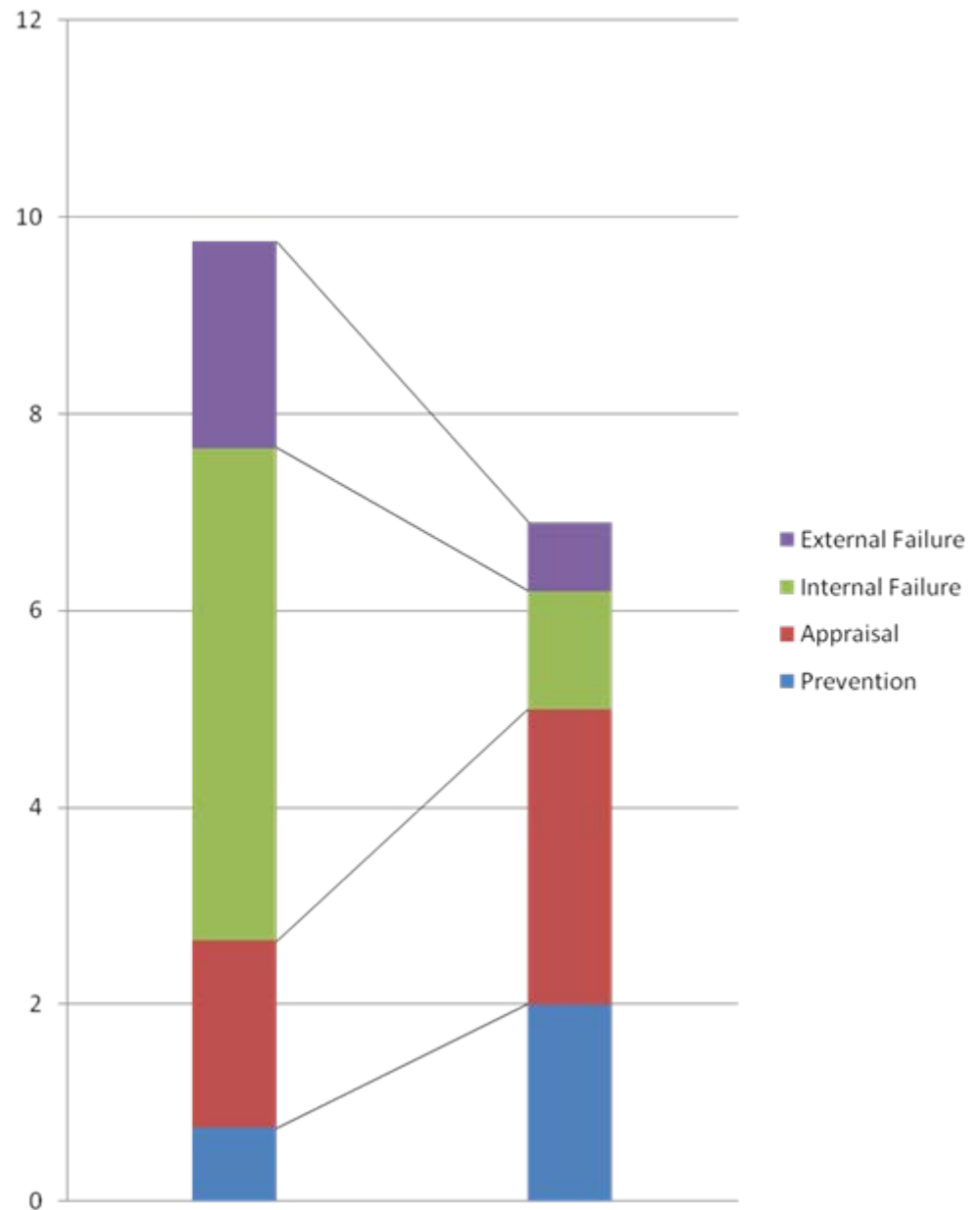
- IEP costs can be separated into four basic/broad categories – “buckets of costs by activity type”.
  - Prevention Costs
  - Appraisal Costs
  - Internal Failure Costs
  - External Failure Costs



As a percentage of “cost to sales/revenue”

- Why will the cost curve take this shape?

- Look at the example of a maturing program, in terms of activities related to costs.





# CAUTION!!!!

- Do not try and build a \$1,000 program with \$100 worth of resources!
- It will not work, and you will be left with a system that causes frustration and eats up your resources for no results.
- Brings us to the next topic.

# Organizational and Functional Structure Considerations

- Before deciding on the organizational structure of the IEP you must:
  - Determine what your goals and objectives of the IEP are going to be.
  - What resources are available or will be allocated.
  - What you are going to do with the results.
- Determine the depth and scope of the IEP
  - (80 / 20 rule of thumb)

- There are many forms of organizational and functional structures you can use.
- The determined purpose of the IEP will determine if the IEP is aligned organizationally or functionally.

➤ Three Primary Choices for Organizational Structure:

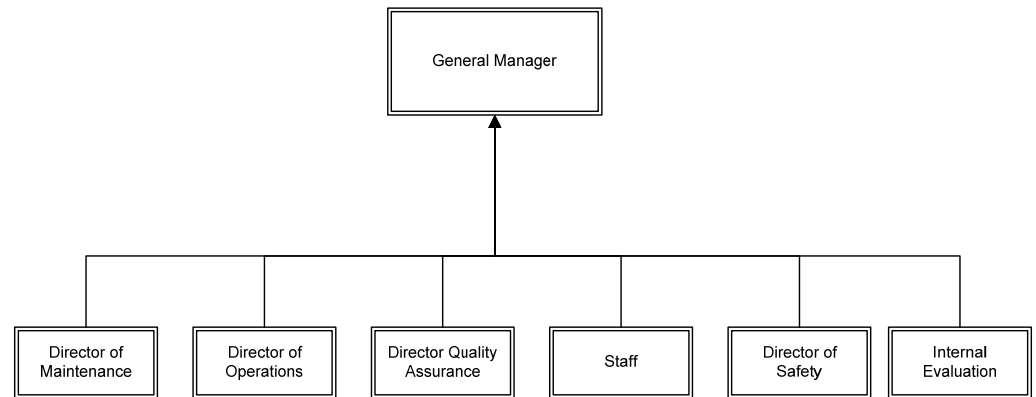
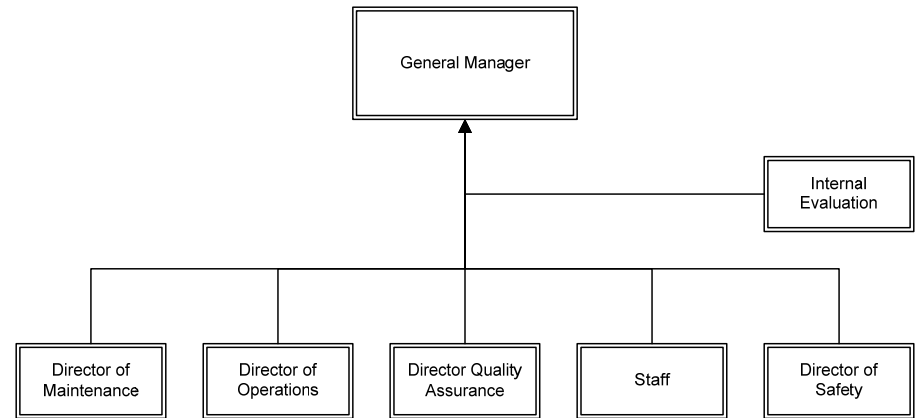
➤ Independent Function

➤ Subordinate Function within a Department

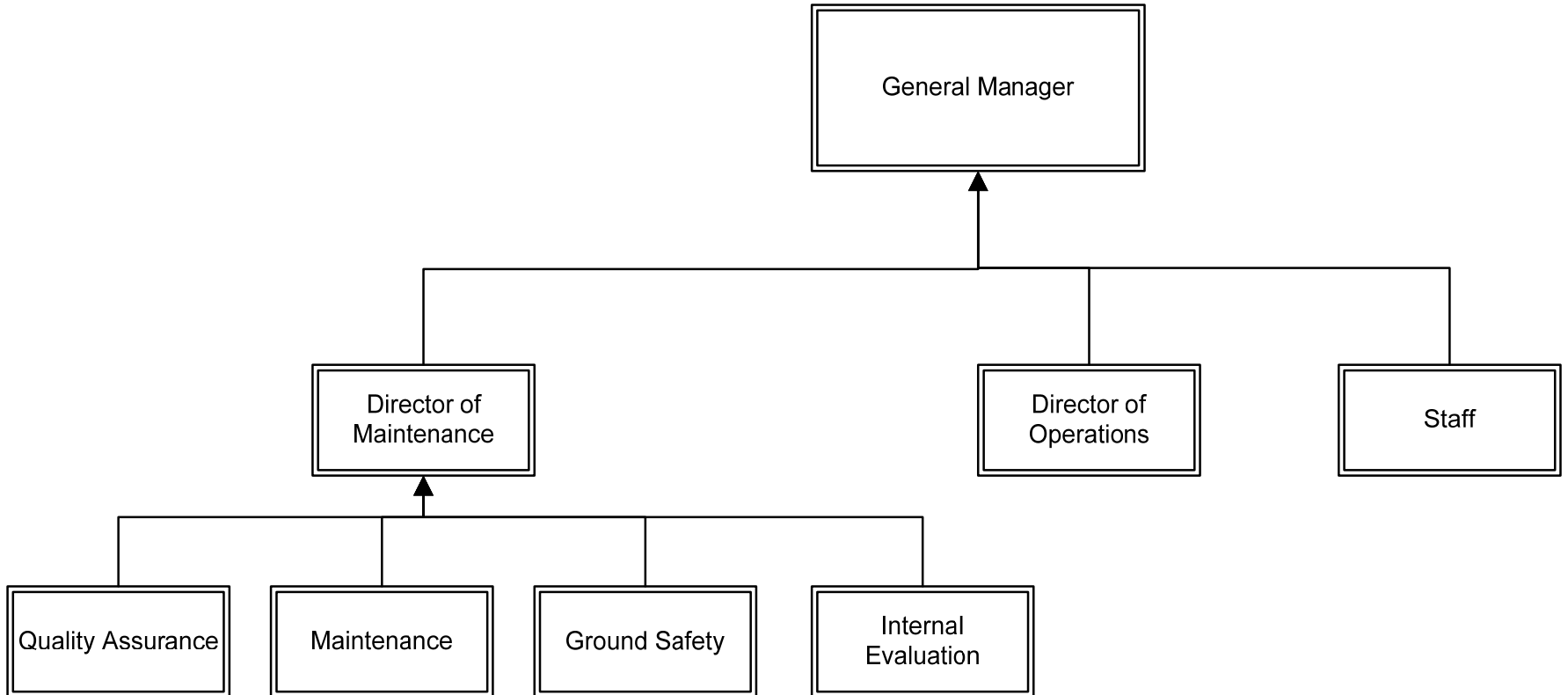
➤ Collateral Duty Function of a Department

# Independent Function Examples

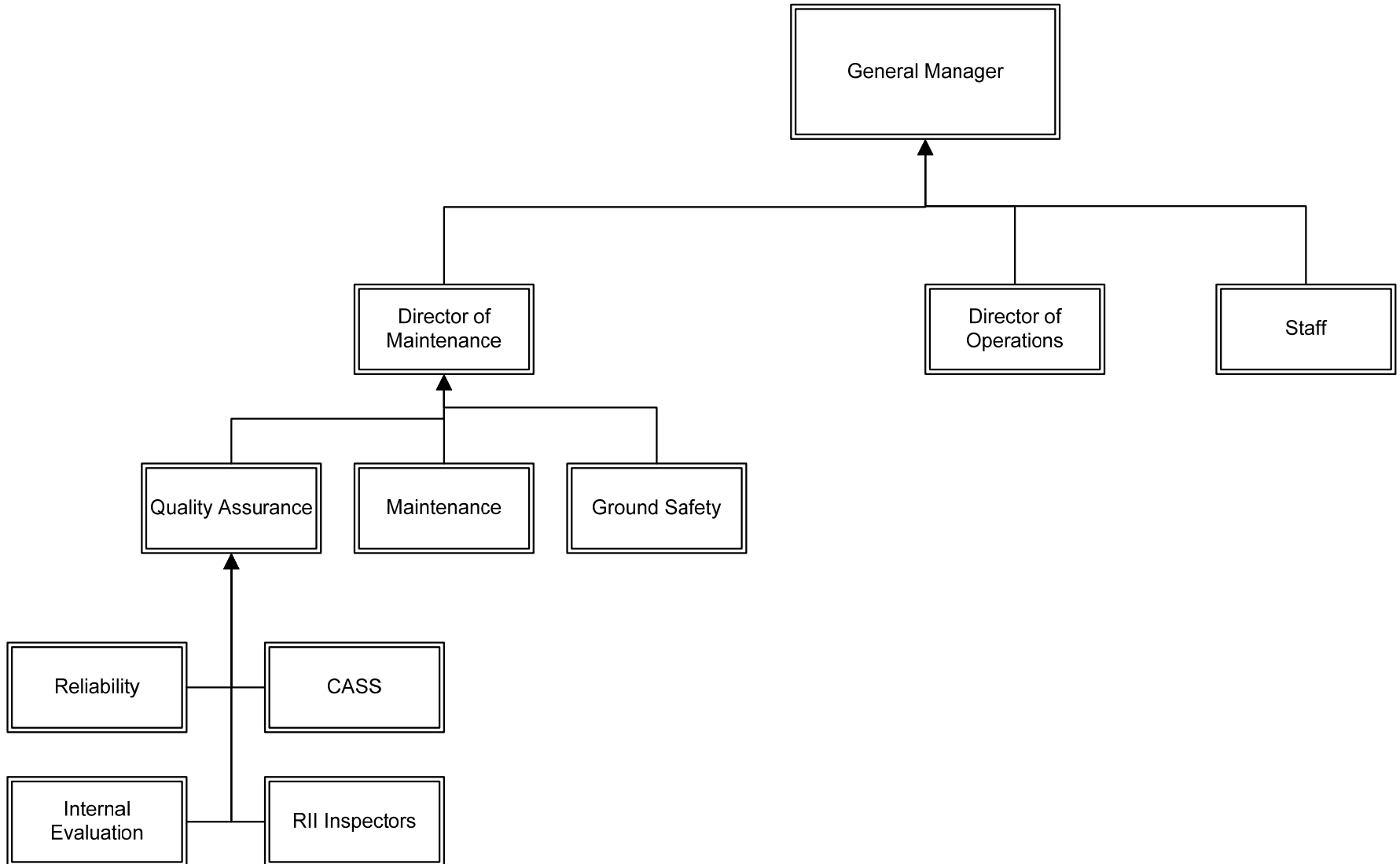
- Independent Function:
  - The IEP reports direct to the senior manager, separate from other operating departments



# Collateral Function Example



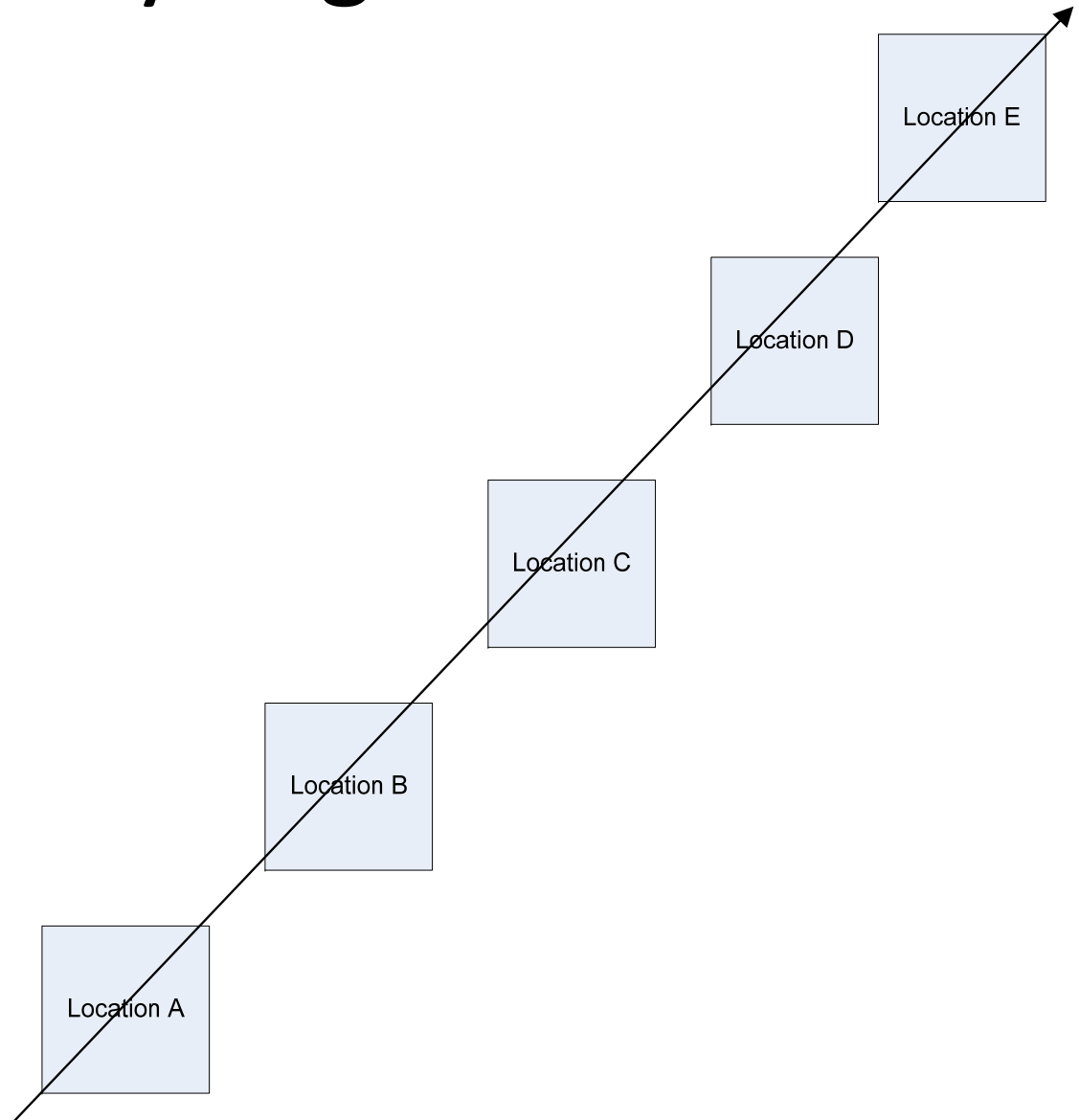
# Subordinate Function Example



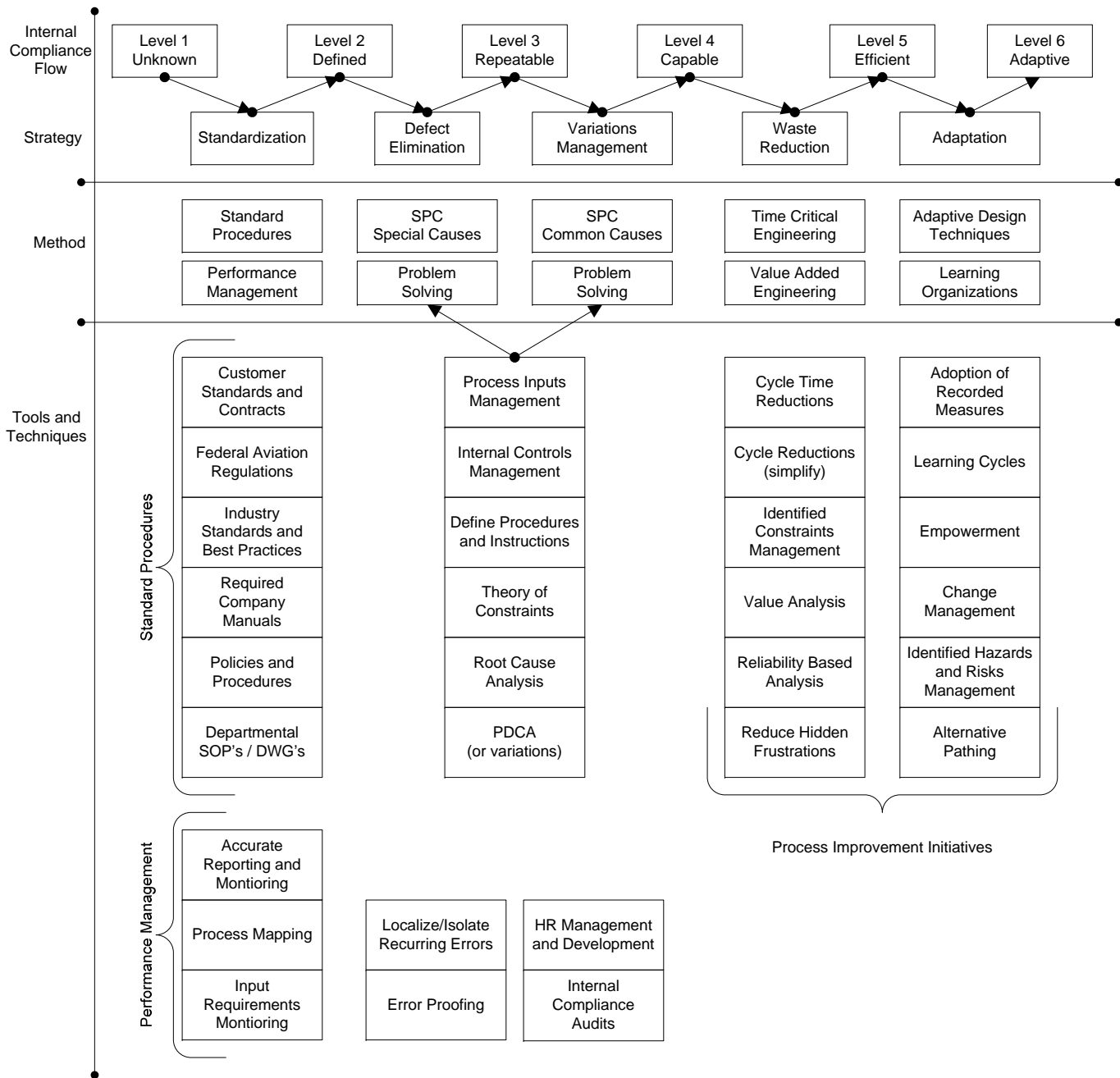


# Company Organization

- IEP Programs, like other can be duplicated throughout an organization, in that the same structure should be the same at each different location.  
(standardization)



- So how does an IEP work?
- How do I get started?
- The Big Picture – or at least the lower left hand corner of the big picture!



Flight, Duty & Rest Records	Flight Operations W&B Records	Crew Qualification Records	Crew Training Records	FOM Compliance	Flight Authorization Records	Crew Training Centers Audits	Maintenance Training (CASS)
Manuals (SEP) (CASS)	RTS (CASS)	Ramp Checks (CASS)	Ramp Checks (Flight Ops)	Maintenance Providers (CASS)	GMM Compliance (CASS)	Quality Assurance (CASS)	Maintenance Records (CASS)
CMTS Inspection Status (CASS)	Drug & Alcohol Program	IEP (Systems) (CASS)	TSA Security	Accidents Incidents (Safety)	External Audits (SMS)	FAA Surveillance	Ground Handling

Functions

- FARs
- CASS
- Safety
- Industry (ACSF)
- AS9100
- SMS

Drivers

Surveillance and Audits

Surveillance and Audit Areas

Routine	High Risk	Identified Problem Areas
---------	-----------	--------------------------

Data Collection - Scorecards

Data Reduction - Scorecards

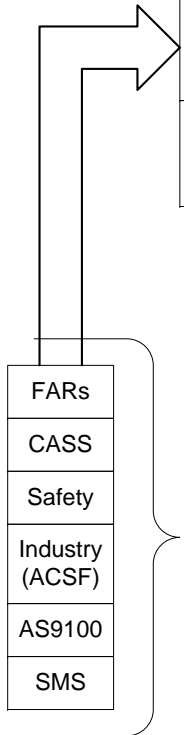
Data & Trend Analysis - Scorecards

Analysis of Identified Problem Areas

Identification of Corrective and Preventive Actions

Monthly Safety and Administrative Meetings

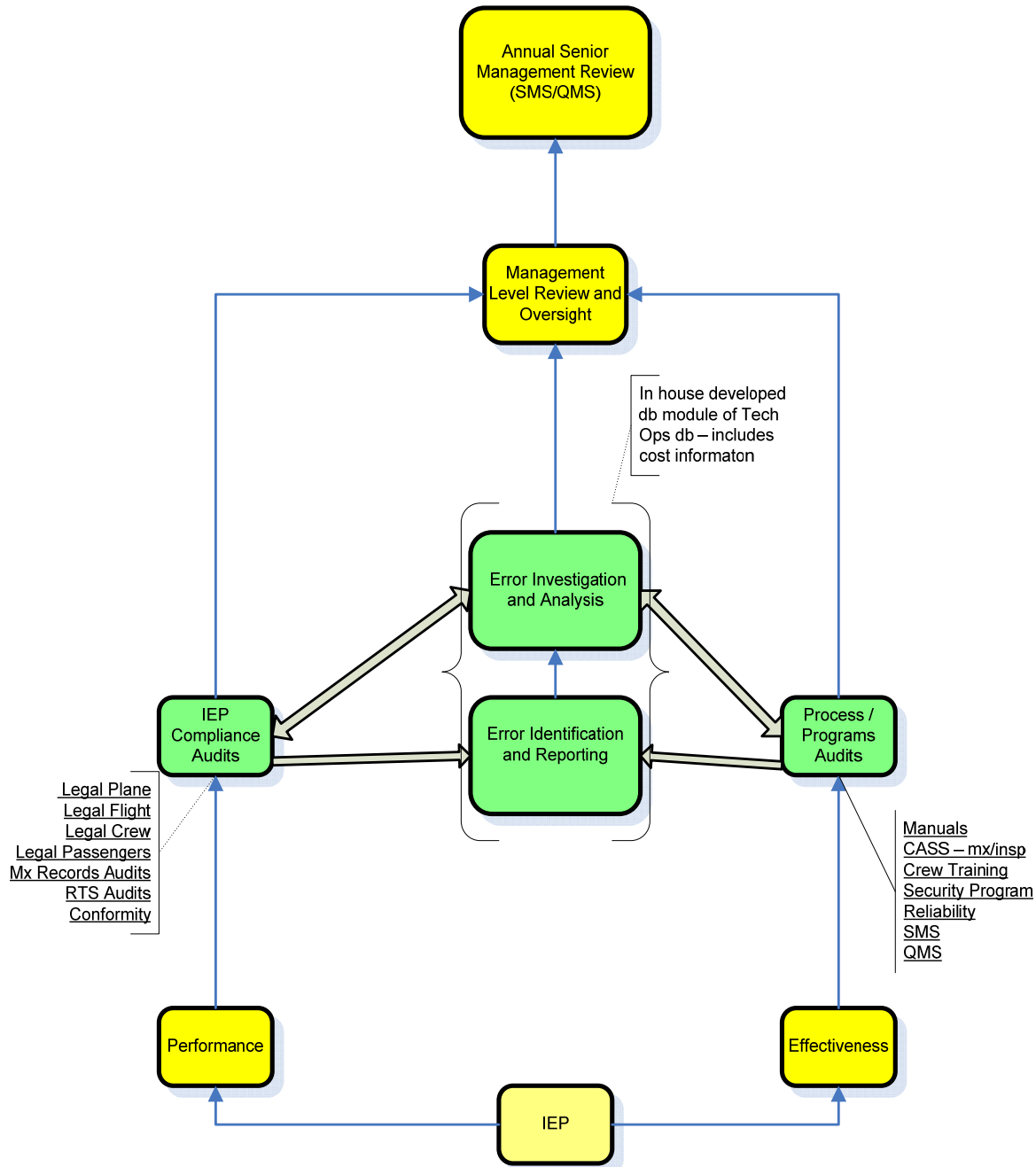
Corrective and Preventive Actions



# Example of one type of data collection scorecard / dashboard!

June 20XX Audit Areas	Total Events	sample size	samples with errors	pass rate	No. of Actual Errors		incomplete	inaccurate	no supporting documents	filed incorrectly	data entry error	improper use	form errors	RISK	Catastrophic / Safety	Critical / Airworthiness	Moderate / Regulatory	Minor / Technical	Negligible / No Impact							
					Total	19																				
1.2.1 - Airworthiness Release	110	110	1	99%	Total	19	6	5		3	5			Frequent (10 Neg 1)												
1.2.3 Log Book Entry	225	100	10	90%	% By Type		32%	26%	0%	16%	26%	0%	0%													
1.1.1 - RTS Packages	335	150	3	98%	Error Frequency		0.0051	0.0043	0.0000	0.0026	0.0043	0.0000	0.0000	Likely (10 Neg 2)												
1.1.1 - CMTS Data Entry	500	150	5	97%	Cause		A	A	R	R	A	R	R													
1.3.5 MEL/CDL Deferred Maintenance	5	1	0	100%	Sampling Rate	43%								Occasional (10 Neg 3)			5	10	4							
Other				#####	Risk Assessment																Seldom (10 Neg 4)					
Other				#####	High	0.00000															Improbable (10 neg 5)					
Totals	1175	511	19	96%	Serious	0.00426																				
Baseline				98%	Moderate	0.008511																				
Rate Gap from Baseline				-2%	Low	0.003404																				

Provides Data Collection and Basic: Data Reduction, Data and Trend Analysis information, Helps identify problem areas, helps identify potential exposure to risks.



# Example of one type of data collection scorecard / dashboard!

June 20XX Audit Areas	Total Events	sample size	samples with errors	pass rate	No. of Actual Errors								RISK	Catastrophic / Safety	Critical / Airworthiness	Moderate / Regulatory	Minor / Technical	Negligible / No Impact				
					incomplete	inaccurate	no supporting documents	filed incorrectly	data entry error	improper use	form errors											
1.2.1 - Airworthiness Release	110	110	1	99%	<b>Total</b>	19	6	5		3	5			Frequent (10 Neg 1)								
1.2.3 Log Book Entry	225	100	10	90%	<b>% By Type</b>	32%	26%	0%	16%	26%	0%	0%										
1.1.1 - RTS Packages	335	150	3	98%	<b>Error Frequency</b>	0.0051	0.0043	0.0000	0.0026	0.0043	0.0000	0.0000		Likely (10 Neg 2)								
1.1.1 - CMTS Data Entry	500	150	5	97%	<b>Cause</b>	A	A	R	R	A	R	R										
1.3.5 MEL/CDL Deferred Maintenance	5	1	0	100%	<b>Sampling Rate</b>	43%							Occasional (10 Neg 3)		5	10	4					
Other				#####	<b>Risk Assessment</b>														Seldom (10 Neg 4)			
Other				#####	<b>High</b>	0.00000																
<b>Totals</b>	<b>1175</b>	<b>511</b>	<b>19</b>	<b>96%</b>	<b>Serious</b>	<b>0.00426</b>																
<b>Baseline</b>				<b>98%</b>	<b>Moderate</b>	<b>0.008511</b>																
<b>Rate Gap from Baseline</b>				<b>-2%</b>	<b>Low</b>	<b>0.003404</b>																

What is the most important piece of information/knowledge you need to learn from your system?

What the data is  
not telling you!!!

What is missing?

What is keeping you up at night?

Where could it go wrong?



# Common Problem Areas

- Over Extending
- Being the Doctor!
- Single Ownership of the Program
- Shrink Wrap – Letting the system fall to the wayside

# Some Do's and Some Don'ts

(not all inclusive)

## Do's

- Define the purpose
- Assign @ appropriate level
- Assign responsibility & authority
- Provide training
- Define system (plan)
- Sr. Management visible & documented support
- Decide what you are going to do with the results
- Allocate adequate resources

## Don'ts

- Assign @ too low or too high level in company
- Expect to happen overnight
- Fail to allocate resources
- Fail to provide training
- Fail to communicate results to all employees (feedback)
- Think it is a one-time shot
- Allow to become just another report

Questions?

Thank You