



Variance Management :: Safety, Service, and Cost Performance

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*By Peter v. Agur, Jr., President
The VanAllen Group, Inc.*

The Issue

Professional aviation faces three major challenges to its safety record:

1. The rate of technical solutions to safety failures is slowing.
2. The Rate of "Human Error" or people-sourced safety failures continues to hover around 70% of the primary factors.
3. The rate of flying by professional crews is growing dramatically.

The math is simple. Commercial and business aviation will soon be experiencing newsworthy accidents with alarming frequency.

Don't take my point wrong. What we have done, as an industry to date, has been very effective. During the '60s and '70s major improvements were achieved in both airframe/aerodynamic and power plant technology. Today the aircraft and its engines no longer contribute to the majority of the accidents and incidents.

During the '70s and '80s, substantial safety contributions came in the training environment with the advent of full motion simulators. The modern simulator allows crews to explore and train to master high-risk flight regimes in a no-risk environment rather than in the aircraft. Additionally, the simulator is an excellent experiential laboratory for perfecting teamwork, Crew Resource Management.

The '90s saw the growing implementation for technology to provide information and prevent crew-induced failures. Excellent examples include Traffic and Collision Avoidance System (TCAS) and Enhanced Ground Proximity Warning Systems (EGPWS). Each of these devices addresses important and catastrophic failure risks.

The first ten years of the new century will see the continuation of initiatives in the arenas of crew fatigue and rest management and Approach and Landing Accident Reduction (ALAR). To date both subjects have been the focus of extensive academic and operational recommendations.

Even with these proven safety procedures and systems in place the accident rate improvements they have caused will be outstripped by the dramatic growth in professional aviation. The popular (?) press will rightfully have a field day with the increased number of bent-metal and bodies resulting from an increasing number of catastrophic aviation events.

To make the challenge even more daunting, we are beyond the point where much of the low-hanging fruit of safety improvements has already been harvested. In other



words, most of the quick and easy fixes that create dramatic results have been implemented. New strides are likely to have ever-increasing costs in time and dollars to achieve while gaining an ever-decreasing incremental impact on safety performance.

That is, unless we do something very different, very quickly.

The Response

I believe the next major opportunity is available to us today. It is low tech, its impact is already proven, and it is completely within your control. It is Variance Management.

Let's face it; during the 1970s corporate leaders came to find that you cannot edict or inspect quality into products and services. They learned that a combination of individual performance and quality controls, or inspections, achieved only limited improvements in failure rates.

During the '80s and 90s business came to realize a blend of technology and organization performance can create the highest standards of quality assurance. In other words, technology and organization performance can, together, make the next quantum leap in safety performance in the professional aviation arena.

Variance Management takes the lessons learned from manufacturing and service industry quality initiatives. You can apply them directly to your individual flight department. You've heard of ISO 9002 and Six Sigma. Each of these wellproven approaches to quality improvement focuses on identifying objective outcomes and the design and performance of delivery systems that assure desired levels of quality, in our case safety that dramatically exceeds anything achieved previously.

The drawback of ISO 9002 and Six Sigma is they are most effectively applied in highly repetitive arenas like large manufacturing and service organizations. It is very expensive and time consuming for these proven processes to be applied in a typical business aviation department.

However, through Variance Management the core methods of ISO 9002 can be a routine part of the way even a single aircraft operation conducts its business. The result can be that your flight department can achieve substantial improvements in safety, service and efficiency.

The process of Variance Management defines the centerline, the ideal path, of your flight department's business, from beginning to end. You and your team work to stay on that centerline. In the terms of organization design parlance, competent Inputs applied to an effective Process have a very high success rate for achieving the defined Results with little or no variance.



You start the Variance Management process by clearly understanding what your results are expected to be:

- Safety
- Service
- Costs

One of the most dramatic benefits of Variance Management is that, as a quality assurance process, it impacts all three deliverables at the same time. It does not treat Safety as a competitor to Service as can happen in many traditional Safety improvement programs.

Zero accidents and incidents is the highest level of quality assurance. You define your ideal, zero variances, and then work to maintain that standard. If that standard is not clearly defined and measurable, your ability to achieve it is hit or miss, pass-fail, or safe-failure. Variance Management helps you to see and measure the centerline and allows you to continually measure and correct your performance accordingly, prior to a significant deviation from the ideal, much less a failure.

The Variance Management process, based on the desired outcomes, clearly defines the processes or flow required to create those outcomes. The processes of each of your flight department's four business units must work together toward a common set of predefined Results to be effective. Those business units are:

1. Management and administration,
2. Scheduling and dispatch,
3. Maintenance, and
4. Flight services.

A quick test of whether your flight department's business units are all working well together is whether or not flight crews have to frequently perform "heroically" in an effort to isolate the passengers from the department's process failures. A common quote in this kind of circumstance is, "No matter how screwed up things may get, I will not let it affect our passengers." That kind of environment has a high rate of variances. Variances lead to failures.

The following are examples of variances and their solutions within each of a flight department's business arenas.



Management and Administration example

- Variance - Operational understaffing (too few technicians or pilots for the defined service results or "mission")
- Variance Measurements
 - Technicians and or flight crews are logging substantial excess duty time
 - Length and frequency of duty days in contrast to rest periods
 - Manager is too busy flying to effectively lead and administer the business
 - What is the required time necessary to run a million dollar of multi-million dollar business? One-fourth of a person? Half a person? One person or more?
- Variance Management Process
 - Confirm the customer's expectations for trip performance
 - Volume and duration
 - Define the measurements and criteria for staff performance
 - Days versus hours
 - Duty days to include standby days, etc.
 - Calculate the staffing levels needed to meet the customer's expectations within your given permanent and temporary staffing environment
 - Include all budgeted days on and off duty
 - Include an effective ratio of lower cost administrative support staff that allows more expensive personnel to focus their time on high level productivity
- Variance Management Impact
 - Safety - duty days and fatigue are more easily managed
 - Service - the customer gets to go on his/her terms
 - Cost - Staffing costs (the second largest in the department) are, by definition, appropriate, effective, and efficient

Scheduling and Dispatch example

- Variance - Key trip information flow is not timely
- Variance Measurements
 - Customer (including his/her administrative assistant) holds onto information until they are certain the trip is going
 - Time differential between customer becoming aware of trip potential versus when the flight department receives initial notification
- Variance Management Process
 - Define the minimum lead time needed or preferred for various categories of trips
 - Domestic trip - non-slotted destination
 - Domestic trip - slotted destination
 - International trip - non-visa destination
 - International trip - visa required destination
 - Special security or service trips, etc.



- Provide lead time information to customers and their administrative assistants
 - Educate them on lead time impact of service
 - Tell them partial or unconfirmed information is acceptable, even preferred versus late notification
- Variance Management Impact
 - Safety - reduced stress on flight department people and systems resulting in a lower likelihood of errors
 - Service - the customer is more likely to go on his/her terms with higher levels of service
 - Cost - lower costs due to more planning and preparation time

Maintenance example

- Variance - Poor maintenance crew-flight crew information flow
- Variance Measurements
 - Flight crew has information regarding the condition of the aircraft or its subsystems that the maintenance staff does not have
 - Pass-fail on complete or partial information
 - Maintenance staff has information regarding the condition of the aircraft or its subsystems that the flight crew does not have
 - Pass-fail on complete or partial information
- Variance Maintenance Process
 - Define the information quality, quantity, and timing requirements for both maintenance and flight staff
 - Post flight
 - Pre-flight
 - Scheduled maintenance
 - Unscheduled maintenance
 - Open or deferred items
 - In-progress items
 - Completed items
 - Establish protocols for communications and records
 - Post flight briefing
 - Squawk sheet
 - Maintenance status sheet
 - Deferred maintenance log
- Variance Management Impact
 - Safety - maintenance and flight crews know the real status of the aircraft and its systems
 - Service - the customer is less likely to be inconvenienced by avoidable maintenance problems
 - Cost - lower costs due to better planning and maintenance support

Flight example

- Variance - Unstabilized approaches
- Variance Measurements



- Aircraft is not in position and configuration for landing at a predetermined approach point (i.e., IFR - outside the outer marker, VFR - two miles from threshold)
 - Approach configuration (gear, flaps, and cabin preparations)
 - Approach airspeed (plus or minus)
 - Approach path (glide slope plus or minus)
 - Approach course (runway centerline plus or minus)
- Variance Management Process
 - Define the requirements for IFR and a VFR stabilized approaches
 - Establish protocols for stabilized approaches
 - Normal approaches - straight-in
 - Abnormal approaches - circling, vectored, or visual
 - Threshold for go-no-go decision and call-outs
 - Missed approach procedure
- Variance Management Impact
 - Safety - reduced risk of consequences from unstabilized approaches
 - Service - the customer gets a better ride and knows what to expect
 - Cost - reduced wear and tear on the aircraft due to fewer abnormal touchdowns

Each of these is an example of an element of Variance Management, as it would apply to specific situations with a flight department, large or small. Although a comprehensive Flight and Maintenance Operations Manual will contain standard operating procedures that may address each of these sets of issues there is a dramatic difference between the stand-alone Operations Manual approach and Variance Management.

An FMOM is a set of rules and expectations that defines what must be complied with. An organization using an FMOM alone either relies on the individual interpretations and adherence to the "rules of the road" or it requires direct supervision and enforcement. Either case leaves a lot of latitude for variances and errors.

An FMOM as part of a Variance Management process is a living codification of how you do business to achieve the defined customer and operational outcomes for your flight department.

Conclusions

- Variance Management works for flight departments, large or small.
- Variance Management is the "poor man's" ISO 9002.
- Variance Management creates measurements everyone can understand and use.
- Variance Management puts your flight department team in the position of understanding what is expected, gives them the responsibility for achieving those expectations and the authority to take appropriate action.
- Variance Management treats safety, service, and cost performance as interconnected deliverables.



- Variance Management helps your people identify deviations from the ideal early. They can then initiate corrective actions before the situation compounds or amplifies, which raises the associated risks to safety, service, and costs.
- Variance Management can have a large magnitude impact on the performance of safety, service, and costs for your flight department.

*** Thank You ***

Peter v. Agur, Jr. is the president of The VanAllen Group, a management consulting firm that supports the success of business aviation service providers. He has an MBA, an ATP and ratings in airplanes, helicopters and gliders. He is on the Flight Safety Foundation's Corporate Advisory Committee, the NBAA's Corporate Aviation Management Committee, and the NBAA's Safety Committee as chairman of the Best Practices subcommittee.