2007

# Transformation — Practical Lessons

Greg Padula

# TRANSFORMATION — PRACTICAL LESSONS

Greg Padula
C5T Corp
Shiloh, IL

This paper will provide a glimpse into the transformation of the Tanker Airlift Control Center (TACC) between 1997 and 2003. It will provide my perspective and lessons as the functional lead during that time. It does not necessarily represent an official position.

## Introduction

***Figure 1.*** The TACC facility – Part of the M2K transformation

The TACC commands and controls 1200+ aircraft and 600+ mission per day to 50 plus countries per day. The command and control (C2) functions are diverse: from regularly scheduled missions much like an airline, to "irregular operations" such as contingency missions, training missions, scientific missions to the Antarctic, rescue missions around the world, as well as classified, presidential support, and Air Refueling (AR) missions.

A small group of visionary TACC and Air Mobility Command (AMC) Commanders set the TACC and the Air Mobility Command on a transformation venture called TACC 2000, M2K, and M21. This effort leveraged the best practices of industry through collaboration with various airline and distribution operations centers and continuing with the hiring of Delta Airlines to help lay the ground work. This paper will provide some insights from the operational and project lead perspectives. It will describe the reason for change (the problem), the catalyst for change, how we organized, some of the results of the effort, as well as provide some lessons observed that could be applied to other transformations and change.

## The Problem

The Problem that drove the transformation stems mainly from the need to work in a peace and wartime global environment – dynamically. Dynamic operations became an imperative with the changing threat and the requirement to adapt to civilian Air Traffic Management (ATM) Constraints. But with the changing threat, international airspace congestion, and reduced manning of our aircrews, all coupled with the need to better use our resources (aircraft and aircrews), it was clear that obstacles to obtaining our operational need had to be addressed.

## The Catalyst

In the past, many within AMC had recognized that becoming more efficient was good, but not imperative (because of the tremendous success record of AMC and the TACC). The new studies of airspace and AMC leadership made it a must do. Then Brig Gen William Welser (now retired Lt Gen) hired Delta Airlines (DAL) for a short study of the TACC. The study produced what the expected – there is much room for improvement. Then Brig Gen Duncan McNabb (now AMC Commander) assumed command of the TACC and said "the planets are aligning;" it is time to move out on a transformation path. He hired DAL back for phase 2 and appointed me as the operational project lead in the TACC transformation – that we now named TACC 2000. Lt Gen Woody Hogle supported many hard decisions such as data link. The support of Gen Tony Robertson, then AMC Commander, can be summed up in his words, "This is a must do, do not wait another day."

> *A Must do, do not wait another day – AMC/CC*

## How We Organized

> *I. Building the Team*
> *II. Building the Vision*
> *III. Implementing*

It required I. Building the team, II. Building the vision, and III. Implementing.

### I. Building the team

*Lean - matrixed - integrated team.* Many practical constraints drove the effort, such as resources (e.g., money and people). Initially the TACC 2000 initiative started with 2 full-time people and leadership support to transform the TACC. Then BG McNabb

made a partnership with the AMC technical directorate (AMC SC: Col Mel Flack). Col Flack assigned Col Terry Williams as the lead for the technical part of the transformation. Col Williams led the technical end, I led the functional end. We both formed a small office to build the functional and technical views together.

***The Team***
- *FIO-SIO*
- *Council of Colonels*
- *Global Partners*
- *Leadership*
- *Informal Structure*
- *Feedback Structure*

*Core Team FIO-SIO: Leverage and integrate functional and technical efforts*. These 2 offices (Functional Integration Office (Lt Col Chris Stuhldreher) and System Integration Office (Lt Bill Col Sweger) (FIO-SIO) met daily to build a plan, solve issues, and implement various solutions to fill our capability gaps. These integration offices had charters that required participation from the rest of the staff in AMC. A key advantage of the FIO and SIO was to leverage current processes and resources to into a focused effort to implement the "Capabilities" needed for the M2K vision. These Integration offices grew to about 10 people each – but they leveraged and focused many efforts both in AMC, USTRANSCOM, and other AF, DOD, and Civil Aviation organizations (like FAA and Eurocontrol). The organization did not grow; the manning was reallocated from other areas.

*FIO: Single Source of requirements; SIO: Enterprise system look*. A chartered task of the FIO was to be the single source of requirements for the transformation. (It was later recognized that the TACC was often leading transformation for the command (AMC) and that was not the role of an execution organization. Prior to the FIO, there was not a single voice for TACC requirements. Anyone that had a requirement went direct to the functional managers for the systems and advocated for their desire (not necessarily even a valid requirement). Similarly, to the FIO, the SIO became the single source to insert cross cutting requirements into systems – an enterprise view. Because of the close relationship between the SIO and the FIO, technical reality was quickly brought into the equation of transforming the TACC. The close and frequent interaction (daily) between the FIO and SIO and at the O6 level eliminated a lot of staffing and posturing. It produced trust and a vision that could be implemented (vision with practicality).

*Council of Colonels:* Part of our decision body was a Council of Colonels that met monthly. These were key TACC stakeholders that would be responsible for implementing their piece of the solution (most of which were cross domain issues – i.e., beyond these leaders own span of control). Additionally, we worked closely at the deputy division chief level to vet ideas, build solutions, and in the process build a significant amount of trust which indirectly translated change management and progress. If vetted through the Deputy level, working at the Colonel level became much easier.

*Global Partners for MAF Transformation:* It was clear very early on that global partnerships or at least cooperation was required for the Mobility Air Force (MAF) global mission. The question was how large to make the network before we would get bogged down. I decided to work internal to the key MAF Command and Control (C2) Colonel (O6) leadership in Europe and the Pacific as well as key Colonels in the Guard and Reserves. These key stakeholders were involved in each key decision. Europe was pivotal because increased civil air traffic congestion was delaying TACC operational missions. On the other hand, the Pacific covered the largest physical area of MAF C2 and had different issues. These leaders not only provided insight to the processes we were building but provided requirements (and some money) for AMC C2 systems. This process not only captured good ideas and innovation by these global experts (and their teams), it made AMC and TACC processes much better for less money. We were able to capture great innovation that was occurring in Europe by such folks as then Majors Tom Nunamaker and Tom Manley.

*Leadership:* It is clear that the leadership was an integral part of the transformation team (Gen Robertson, Gen McNabb, Gen Welser, Gen Mike Wooley to name a few) as well as the others I have mentioned. They helped form and validate the vision and its implementation and their leadership was essential in overcoming many roadblocks / resistance to change. It is amazing that even with four-star general officer direction there was significant resistance.

*Informal structure*: We had a "brain trust" of people that were visionary and practical. They were often in O6 leadership positions – but not always. This informal team included visionary folks in the Europe, the Pacific, and USTRANSCOM (some of the individuals involved include Col Nick Sipos, Col Paul Williams, and Col Roger Warnick). This small group of individuals allowed the team to come up with acceptable transformational ideas and projects that could be refined and implemented across the global structure.

*Feedback Structure -- M2K Advocates*: M2K "advocates" were key members of the team that not only provided feedback on all aspects of M2K they were

our eyes and ears and were able to capture the innovation at the unit level. Furthermore, these advocates provided a solid connection to the user in all the areas we could think of (including aircrew, to C2, base operations, airfield management, and maintenance).

As you can see, "advocate" does not adequately describe their role. We carefully selected them to be diverse, grounded, trusted at the unit, and visionary. Then we trained them formally on the vision and how to help facilitate and influence its implementation.

## II. Building the vision – with "practicality"

*Vision greater than TACC:* It did not take long to recognize the vision required for the TACC to operate in a global dynamic environment was much bigger than the TACC. However, it also made sense for the operations which needed the change to drive the vision and its implementation. The vision evolved very quickly to 3 high level goals. Just by establishing and communicating these goals, we were able to identify many aspects to implement the vision.

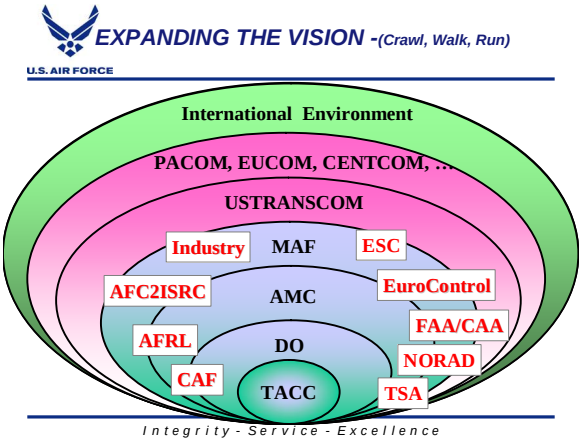


***Figure 2.*** TACC Capability requires a cross domain solutions – and an International and Joint perspective

*Goal1: Seamless Processes* – this included many cross domain processes. It was always process first. We built an "as is" and then a "to be" process.

*Goal 2: Seamless Systems* that provided "information at the fingertips" of the decision makers.

*Goal 3: Assured connectivity* – We needed this so we could have collaboration among the decision makers. We needed links between multiple ground nodes as well as air nodes.


***Figure 3.*** Integrated Flight Management is a subset of Mobility 21

*Cross Domain Solutions:* We considered many areas for improvement but especially across these 3 domains: 1) Military Command and Control (peace and contingency locations), 2) Domestic and International Civil Air Traffic Management, and 3) the Aircrew crew.

## III. Implementing

*The approach:* The solution was a revolutionary change in a mostly evolutionary way. We did this mainly in a "Crawl, Walk, Run" manner. It required "Vision with practicality." Leadership support and change management were more important the more revolutionary the change. We focused on results relatively quickly. We worked the longer term items, but used the success of the short term implementations to keep momentum. Approach was capabilities based, used common sense and had just enough analysis to make good decisions (see lessons observed).

*Capabilities Management (C-R-r):* The entire process we built was structured around implementing the M2K Capability (C) – which remained our focus. To obtain that Capability, we often had to fill enterprise (cross domain / or multi-systems) Requirements (R), and finally we had to work with the traditional requirements process that works individual requirements (r) through Functional Managers and then Systems' Program Managers.

***Managing Implementation***
- *Capabilities Focused*
- *Common Sense*
- *Practical*
- *Implementation Focused*

*The solution*: The solution was multi-prong. It was about developing and managing the capability needed to respond in all global environments verses building/improving a system or communication path.

*DOTMLPF:* We looked at Doctrine, Organizational, Training, Material, Leadership, Process, and Facility (*DOTMLPF*) as potential solutions. Each of these areas was part of our potential solution set. This is common in AF solutions.

*The roadmap:* We built a roadmap with 371 items. The visibility of this helped keep the implementations on track. This was tracked on multiple levels on a daily basis by the FIO-SIO. They identified the issues that were not meeting expectations / milestones were highlighted.

*Decision points:* The highlighted issues were solved at the lowest level possible, often at the FIO-SIO or the technical and function leads. If not resolved there they were brought to the Council of Colonels and on semi-annual basis to the General Officer Steering group (GOSG). This GOSG was led by the AMC Commander and attended by many AMC General Officers at Headquarters AMC and USTRANSCOM and many field locations attended by VTC.

*Collaboration:* We used many forms to collaborate within our team including regular face-to-face meeting, telephone, and the web to gather/distribute information.

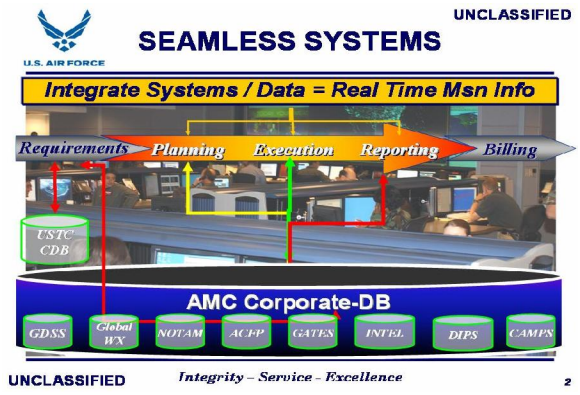


***Figure 4.*** Systems view from requirements to billing

**The Results**

This effort moved the TACC (and PACAF and USAFE C2 structure) from mostly a mission monitoring and management by exception organization to a proactive mission and sortie management organization. Initial Capability was stood up in about a year and a half of start. The close partnership between the Operations and technical community allowed us to have 62 builds of our integrated management tool and prototype in use in an operational environment in 12 weeks. The speed and functionality of this effort could only be done with someone bridging the Ops – tech gap. Visionary and dedicated people like Steve Hofmann often brought operational changes to the developer nightly. This provided the template for the information that the Flight Manager needed to manage missions dynamically and globally. Once we built the view we needed we went about trying to fill the holes in data that we had. It needed to gather information from 9 different systems.

The M2K transformation resulted in several spin offs including the Velocity Initiative (VI). VI goals were mainly to move the mission faster. We used a similar method of transformation to drive this initiative, appointing a lead and leveraging M2K advocates from across the US, Europe, and the Pacific. We held several face-to-face meetings, built and coordinated an implementation plan, and then tracked implementation through the M2K process / team structure. These efforts are still ongoing. VI and M2K are being institutionalized into AMC's Capabilities processes.

**Lessons Observed**

*The Right Team:* Not too big, but diverse and representative. Look for knowledge, experience, openness, influence, and passion. The right people will work much more efficiently. *Build a team diverse enough to link to every level, but that is lean enough to processes* decisions relatively quickly. Consider using a structure like M2K, including the *FIO-SIO, formal and informal network, Brain Trust, and advocates.* There must be a *Champion at the top and at multiple levels.* AMC/CC active support was essential, but without other advocates at many levels it would have failed. The collective team support not only manages and implements elements of M2K, but also changes the underlying organizational culture.

*Vision with Practicality:* Build the vision, morph it, but stay focused on the practical. We did not shoot for the 100% solution or 100% information to make decisions. We knew that perfect information cost infinite dollars and time. Furthermore, the solution that we wanted was often a long-term solution. But there were many solutions that were lower risk and less expensive that would allow us to move forward. Do not compromise the long-term vision, but review the technical and financial risks to see if it is practical to implement in the needed timeframe. Also consider what is impractical for one level of authority may be practical at a higher level of authority. AMC CC and the support he garnered at the Air Staff allowed implementation not possible at our level. It was our job to understand when to pass the baton up to our bosses.

*PTSOP (Put This Stuff On Paper).* AMC DO (then Maj Gen Brady) said this. It is a true statement and a good lesson. Document it on paper early. Once on paper, even if it initially misses the mark, it will evolve into the desired document as people use this paper strawman as a collaborative tool.

*Manage the Capabilities / Obstacles.* Understand the end game, build a roadmap with a plan, and then do not lose focus. Everything else is an obstacle to get the capability. Each capability should have a person who is primarily responsible (OPR) and a small group that that will be accountable to the management team. In that process, we identified obstacles to completion. At that point, it a large part of our effort was on obstacle management.

A capabilities look at implementation is often incongruent with traditional DOD acquisition -- which is systems based. In this new method, we focused on the vision first, then process then solutions. To make this work efficiently we found that a tightly knit team of operations and technical management allowed much greater efficient and effective results.

***Lessons Learned***
- *The Right Team*
- *Vision with Practicality*
- *PTSOP*
- *Manage Capability*
- *Roadmap/Visibility/Accountability*
- *Tight Decision Loop*
- *Targeted Analysis*
- *Bridge the Ops – Tech Gap*
- *Leverage work / resources*
- *Manage / Focus on the seams*
- *Momentum-Continuity*
- *Communication / Feedback*
- *Change Management/Culture*
- *Manage Risk*

*Roadmap/Visibility/Accountability:* These were essential to this management process. We started with the Capability (and individual functionalities) and built a roadmap to fill each. Visibility of each of these milestones / actions items brought the appropriate attention and enhanced accountability. Visibility occurred at every level depending on the issue. Daily interactions, weekly web postings, quarterly Colonel meetings, General Officer Steering Group, and finally about every 6 months we briefed the AMC CC and much of his staff. Just knowing that areas would be highlighted at each level encouraged them to be fixed. Progress was enhanced at each level. At last count there were 371 items that we were tracking in the roadmap for implementation.

*Tight Decision Loop:* Consider a blended team like the FIO-SIO. They added creditability, visibility, and solved many of the problems very quickly. Have leadership with authority at the meetings if possible. Use meetings with a focused end in mind -- brain storming, talk about differences, and set action items /plans ahead. Keep accountability. Follow up on action items and publish to the authorities – include the plan and who is accountable. I recommend a "*Brain Trust"* and network to keep you grounded and to facilitate the decision process.

*Targeted Analysis:* In determining practicality *do not have analysis paralysis.* The amount of objective and subjective analysis varies depending on risk and other factors. We performed our big picture analysis using the common sense of the experts -- "grey beards" of our internal group. Detailed analysis was occasionally needed to take us from the big picture, common sense view to a more rigorous analytic view that would stand up to the budget process scrutiny. For example we performed economic analyses (EA) that help justify the eventual cost in the hundreds of million dollars. The "rigorous analytical" conclusions were essentially the same that our internal group derived, but we now had rigorous justification that would stand up in many forums.

*Streamline processes to implementation.* Do what is required, but think outside the box to satisfy the requirements without extra work. Initial feedback from staff members indicated that to do this transformation we would need many requirements documents that would take years to build. Our answer was to build a "Detailed Requirements Matrix" that cross referenced every requirement we had to other approved documents. This saved over a year and kept momentum. There was some resistance to this approach, as with many things that were different.

*Bridge the Operational and Technical gap.* These are often separate worlds with separate languages that truly need a bridge to garner the best of both worlds. The technical experts include system builders, communication specialist, technologist, comptroller, as well as acquisition specialist. The operators include AOC/C2 controllers, planners, flyers, maintainers, and any user of technical areas. The misunderstanding between the 2 main groups creates huge obstacles to progress. Bridge the gap and focusing on the seams allows one to leverage the best of both worlds.

*Leverage existing work and resources. Do not reinvent wheels (unless required).* We leveraged much including AMC, USAFE, PACAF, FAA, DOT, EUROcontrol, and more. We leveraged bright ideas from airmen to Generals. For the long term areas, we used traditional processes and built a strong partnership with the AF Research Labs. We partnered with the labs (built an MOU in 1999 to institutionalize AFRL as part of the long term technology infusion

into the TACC on a regular basis). The move to "flight management" leveraged best business practices of airlines dispatch. In doing this, we used the AMC requirements process and helped focus AMC resources on what AMC leadership said were command priorities. This refocus was not always appreciated or understood by those that were required to change. We also used the traditional method of coordinating -- Staffing. This formal method will produce a coordinated position and will surely be signed out as it goes up the chain. Staffing went much easier because of the team we had.

*Manage / focus on the seams.* Most of what we need exists, but is not available across the enterprise. Even if an 80% solution is some where else, it is less expensive to expand and leverage that capability than reinvent it internally. Managing the seams can save huge money and provide quicker and better solutions to deliver more capability. These seams include the process and systems seams.

*Momentum- Continuity:* Support and progress is exponential to momentum. Do not lose momentum unless there is a real show stopper, but realize the consequences. Understand the slow down and address at the appropriate level. Do not hesitate to go to leadership as needed. Keep the faith with the team. If you need to go to leadership ideally coordinate with your trusted team leaders, but at least inform them. On several occasions we went forward without full concurrence and occasionally "broke traditional glass." I am convinced this was needed for progress including implementing dispatch like capability. If you just work the long term, you will probably lose momentum, so, *work the long term areas under the "cloak" of short-term successes.*

*Continuity* of the vision keepers and change agents is important to implementation. When the continuity is broken, the change will seek the steady state of the *culture.* Hence, it is important to change the *culture* to one of continuous process improvement.

*Communications / feedback:* Have a detailed Communication plan ranging from face-to-face exchange, advertising, briefings, newspaper and magazine articles, web portals, and other multi-media type events as well as incorporation of the ideas in the Command's policy and presentations including Command video. The advocates provided a great feedback mechanism. General and targeted "prototype feedback to users (e.g., crews, flight managers) was significant. We also provided our feedback to them.

*Change Management / Culture:* Plan for and have an aggressive Change Management plan. There was overt and covert resistance to the change. Some felt change was a threat to their way of life, others thought there were dangers in the change. We listened very carefully and addressed each concern or changed our implementation plan. In some cases, the resistance defied logic and in those cases we worked to overcome it. We used personal interaction, lowest level supervisor involvement. Many decisions were resolved at the FIO-SIO or Colonel level, but there were major issues that required AMC CC involvement. Consequently we provided a Program Management Review about every 6 months to the AMC CC and his staff as well as a VTC for the remote MAF General Officers. These very high level forums garnered decisions we needed. Authorization to change the flight management process, add government positions for flight managers, add data link for C2 to the AMC plan were decided at these high level meetings. Documented support helps change the culture. When M2K was identified as a Command priority, it could be used to help justify dollars for the programs. M2K then became an excuse for innovation. The culture appeared to be changing. Culture change is slow - years. Often some of the biggest changes I saw were in people who experienced the benefits of M2K in the field. When they returned to headquarters, they became positive change agents.

*Manage Risk -- not avoid it.* Risk avoidance mindset is incongruent with revolutionary transformation. Often as we improve one thing something else suffers. E.g., if security increases it may reduce the capability elsewhere. The most secure computer is one you do not turn on and the safest airplane is one you do not fly (unless you are being shot at). Our great operational/technical team was able to balance risk.

**Summary**

This short paper certainly did not do justice to the M2K transformation. The success was a tribute to many who worked way beyond what was expected. It was a lean and agile transformation with many factors that contributed to its success some of which were mentioned in this paper. The M2K lessons can be applied to many other situations especially those with dynamic changes like in DoD and Industry.