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PROBLEM SOLVING: COLLABORATION AND TEAMWORK— THE KEY TO SUCCESSFUL WARFIGHTER CONTRACT SUPPORT

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The Defense Contract Management Agency (DCMA) and the Rolls-Royce Corporation discovered that through close collaboration and teamwork, day-to-day business issues that previously required significant time and resources to be resolved instead quickly started to disappear or to require less effort to be resolved. This article discusses the underpinnings of a successful government and contractor collaboration through the discussion of DCMA's contract management services, the contractor's environment, technical challenges realized within manufacturing and business systems, followed by a look at problem solving approaches and philosophies, all of which led to significant improvements in both the quality and on-time delivery to the warfighters at a fair and reasonable price.

The Defense Contract Management Agency (DCMA) is a combat support organization within the Department of Defense (DoD) that provides worldwide contract management services to all branches of the U.S. Armed Forces as well as to other government agencies, such as the U.S. Department of Energy and National Aeronautics and Space Administration (NASA). In addition to DCMA's global offices, the Agency consists of men and women currently deployed overseas performing Contingency Contract Administration Services (CCAS). The DCMA's mission is to "provide customer-focused acquisition life cycle and combat support to ensure readiness, worldwide 24/7" (DCMA Vision, Mission, and Goals, n.d.). For

that reason, the people at DCMA strive to make certain that the warfighter receives the right product at the right time while paying the right price. This is accomplished through the effective integration of various disciplines, as practiced by administrative contracting officers (ACOs), contract administrators, price analysts, industrial specialists, quality assurance specialists, engineers, support program integrators, earned value management, property administrators, and management analysts. A key figure in this challenging effort is the ACO, who functions as the integration agent ensuring proper interpretation and execution of the contractual obligations between the contractor and the government. In this role, the ACO can effectively interact between the contractor and the government contract administration support team to ensure the warfighter's requirements are fully met and the delivery of products and services occurs within both cost and schedule at the highest possible level of quality. The DCMA Aircraft Propulsion Operations-Rolls-Royce is the cognizant DCMA office located in the contractor's facility in Indianapolis, Indiana.

ENVIRONMENT: CONTRACTOR MANUFACTURING FACILITIES

The Rolls-Royce Corporation in Indianapolis, Indiana, maintains 2.6 million square feet of manufacturing space and an additional 900 thousand square feet dedicated to research and development. The facility employs 4,300 workers and delivers approximately 2 engines and \$1 million in spares per day, and has 2,700 active machine tools, 7,000 active part numbers, and \$1.5 billion in annual sales.



FIGURE 1.
ROLLS-ROYCE DEFENSE NORTH AMERICA, INDIANAPOLIS, INDIANA

Furthermore, Rolls-Royce has invested over \$200 million in capital improvements since purchasing the facility in 1995.

Rolls-Royce Corporation's primary product, gas turbine engines, supports civil, military, energy, and marine applications worldwide. Major customers include the U.S. Navy, Army, Air Force, Marines, Coast Guard, Lockheed Martin, Northrop Grumman, Bell, Boeing, and Embraer. The facility, formerly Allison Engine Company, has a proud heritage of supporting the warfighter. Since its inception in 1915, the company has produced state-of-the-art engines that embody cutting-edge technology. The facility has produced over 110,000 engines. From the venerable T56 turboprop, used on more than 5000 C-130s worldwide, to the latest AE1107 Liberty engine powering the V-22 Osprey and the AE3007 turboprop utilized on the RQ-4A Global Hawk, the tradition continues. The company's performance has been validated by the presentation of seven Collier Trophies for innovation since 1987.

TECHNICAL CHALLENGES

MANUFACTURING AND ON-TIME DELIVERY

The timely delivery of quality products is a primary goal of the procurement activity, DCMA, the contractor, and ultimately, of great significance to the warfighter. The importance of this goal is reflected in the DCMA performance metrics, which were adopted by Rolls-Royce senior management. In order to achieve this goal, the manufacturer must employ adequate program management, master production scheduling, and enterprise resource planning. In today's commercial environment, specifications normally originate from the Original Equipment Manufacturer (OEM) in response to performance requirements from the government. To achieve this, required performance tolerances on specifications are even tighter with little or no variance. Additionally, in today's post-9/11 environment of multiple military deployments, increased demands of products and services, raw material shortages, and increased research and development activities, the ability to deliver a flawless aircraft engine or component when the government wants is an ever increasing challenge.

FINANCIALLY VIABLE BUSINESS SYSTEMS

The contractor's business and financial health is of major concern to the government, as a higher degree of financial risk can mean increased costs to the government. This is especially true with large contractors, upon whom the government relies to provide major defense systems and subsystems. The assessment of this financial risk to the government is accomplished through the application of business systems¹ and Cost Accounting Standards (CAS)² as established by public law. Adequate Business Systems and CAS compliance means smoother and less complicated proposals and pre-awards through a greater reliance on the contractor's ability to track, estimate, and forecast costs, which results in lower risk to the government and earlier contract award. Large defense contractors, such as Rolls-Royce, endeavor to maintain "adequate" business systems and CAS compliance

even though adequacy can be somewhat subjective. Although business systems are highly regulated, the determination of an adequate business system often rests on the application of the government's interpretation of the regulatory and statutory language against the contractor's current policies and procedures. Keeping a company's business systems adequate is a daunting task but the lack of adequate business systems can lead to the loss of new government contracts and subcontracts as well as possible withholds and decrements consequently creating cash flow and resource issues for both the contractor and the government.

PROBLEM SOLVING APPROACHES

MANUFACTURING APPROACH

Approximately five years ago, the leadership of Rolls-Royce and the local DCMA realized that a different approach was needed to increase the timely delivery of quality engines and components. Out of this need was born the integrated team approach, which has transformed the way the government and the contractor do business.

The first team assembled was chartered to identify and eliminate the causes of late delivery. In contrast to past practices, both DCMA and Rolls-Royce representatives were in the room together to discuss specific issues and solutions. Each step of the process was mapped, resulting in a combined understanding of the factors driving delivery excellence throughout the entire supply chain including delivery to the end user. Tracking performance was accomplished by the Team's agreement to use the DCMA On-Time Delivery 2002 proposed Performance Goal of 70 percent as a baseline. Team members shared timely and pertinent information and discussed solutions resulting in an atmosphere of understanding and trust focused on eliminating obstacles. This joint collaboration resulted in the Team setting a higher local on-time delivery goal of 90 percent for 2006, of which Rolls-Royce has consistently achieved a level of on-time delivery of 95 percent or better. More importantly, the process also took the surprise factor out of the equation. If a part was going to be late, required rescheduling, or had other constraints, both parties knew about it well in advance. This information could then be provided to the procurement activities so that mitigating actions could take place as required.

This approach garnered wide recognition. First, the facility was awarded for Outstanding Supply Chain Management by the U.S. Air Force Material Command in 2001. It was also awarded the DCMA Herbert W. Homer Team Performance Award—Delivery Management Integrated Product Team in 2002, and the Rolls-Royce Chief Executive Quality Award in 2003.

Since the first integrated team, many others have been chartered with similar results such as quality assurance, in which Rolls-Royce and DCMA share audit schedules, findings, trends, and corrective and preventative action programs. The DCMA now accompanies Rolls-Royce during each of their ISO 9001 audits and certifications. They also attend outbriefs and participate as corrective and preventative actions are assembled. Other teams perform Material Review Boards (MRBs), as

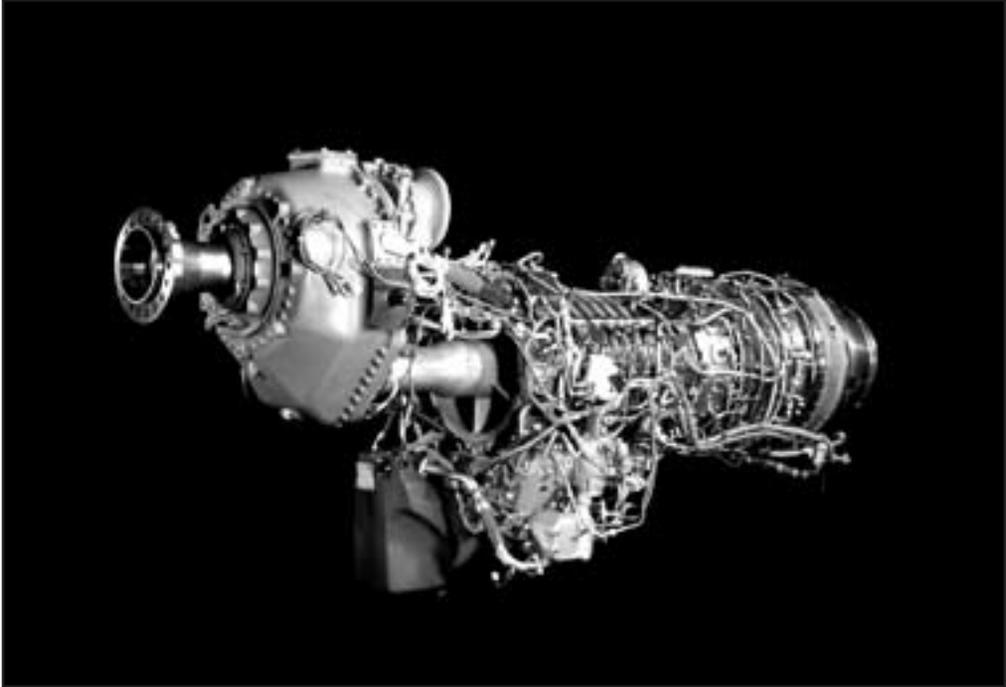


FIGURE 2. ROLLS-ROYCE AE3007 GAS TURBINE ENGINE

well as reviews of vital statistics, scrap, compliance, process initiatives, and field feedback. The DCMA keeps Rolls-Royce informed about field reports so there is a real—time review and both organizations stay proactive in dealing with any issue real or potential that may impact the end user.

This integration has promoted the tenants of open communication, trust, and continuous improvement, all of which are vital to the success of our combined mission to provide the best quality engines and commodities possible.

BUSINESS SYSTEMS SOLUTIONS

The purchase of the Indianapolis facilities by Rolls-Royce in 1995 created major changes in the company's business systems and complex accounting practices, which continue to evolve. Realizing that sound business systems and accounting practices are crucial elements in maintaining and securing government contracts, the government and Rolls-Royce began in 2004 to take a proactive approach to ensure the company has strong internal business and financial controls by implementing a biweekly Integrated Process Team (IPT). Participants in this IPT include various members of Finance and Compliance on the part of Rolls-Royce Corporation. Government participants include the DCMA ACO and the Defense Contract Audit Agency (DCAA). Meetings include the review of all open issues and airing concerns and observations. If system improvements are warranted, the process begins immediately rather than awaiting the issuance of a DCAA draft audit report. The IPT has experienced several instances where early identification of issues and

immediate evidence of contractor corrective actions resolved the issue and negated the need for further DCAA involvement. Moreover, due to the open deliberations that occur within the process, the ACO is in a greater position to make an informed determination that is beneficial to both the government and the contractor all while satisfying regulatory and statutory requirements.

An additional example of open communication and transparency of company processes include the active participation in company system conversions. For example, when the company implemented a Plant Structures project to replace the Billing and Material Management Accounting Systems (MMAS) on the Systems Applications and Products in Data Processing (SAP), DCMA and DCAA were invited to all training sessions and steering committee meetings. The government was also provided an “issues log” enabling them to track the resolution of system implementation issues.

In addition to IPT meetings, the company’s Government Compliance Manager and the DCAA Supervisor meet regularly to review all business system status reports. This meeting is directly related to the IPT process and, again, allows for early identification of potential issues, rather than addressing the issues within an audit report. The DCAA’s timely reviews, once corrective actions have been taken, represent another necessary aspect both the company and DCMA rely upon.

COLLABORATION AND TEAMWORK

PROBLEM-SOLVING PHILOSOPHY

Up to the moment when DCMA and Rolls-Royce decided to join efforts to address and solve issues in a collaborative fashion, both parties basically performed issues analysis and resolution independently of each other. This approach was inefficient in that a lot of time and effort went into solving issues in isolation; data and information were exchanged in separate analytical environments. This method had the disadvantage of requiring multiple exchanges of data and information without the benefit of having the same forum or the right individuals with the knowledge and expertise to provide answers and clarification in a real-time basis. Therefore, solving issues was a lengthy and time-consuming endeavor not sufficiently agile to resolve issues.

Once both parties decided to join efforts and work collaboratively in the early identification and resolution of issues, efficiencies were realized immediately. Both teams as well as the warfighting customers started to see the tangible benefits of this approach though increased on-time delivery, a reduction of quality issues in the field, and a better understanding of the contractor’s business and financial health. What actually existed after the new collaboration efforts began was a collectively shared sense of purpose augmented by the empowerment given to both DCMA and Rolls-Royce teams by their senior management, thus enabling the teams to tackle the issues and allocate resources to solve them.

THE DCMA AND ROLLS-ROYCE EXPERIENCE

Gigantic strides have been made in the overall relationship between DCMA and Rolls-Royce, primarily due to the realization that (a) both are working toward a common goal of providing the best product to the end user at the right time and for the right price, and (b) that in today's environment of declining resources, it is better to offensively pool assets towards common goals rather than to use assets defensively against each other. Such a relationship must be built on trust and an understanding that both the government and the contractor share an immense obligation and responsibility to provide the best quality product to the end user when and where it is needed. However, trust and understanding play an even greater role where the goals of the government and the contractor differ, such as disagreements about price, delivery schedules, or policies, such as the Berry Amendment Specialty Metals Clause,³ Critical Safety Items (CSI),⁴ and Business System Status. In such situations, the need for open and honest communication is imperative to keep product moving, the contractor paid, and the opportunity granted for new business and corporate growth. Hidden agendas and unilateral posturing lead only to an environment of suspicion and lack of cooperation whereby everyone, especially the end user, loses through the re-alignment of resources in a defensive posture.

Most importantly, both government and corporate senior management have given their people the authority to exercise prudent business judgment in the resolution of issues as well as binding the parties in bilateral agreements. Conversely, along with such authority comes accountability as well as the realization of the consequences of honoring agreements and commitments. Thus, the framework of government



FIGURE 3. ROLLS-ROYCE 2100D2 TURBO PROP ENGINE

and corporate collaboration is very similar for both the manufacturing and business systems environments. The lines of communications have been established through senior management sanctioned IPTs, giving the individual teams the authority and accountability to work out complex issues and implement prudent business corrective actions. This in turn leads to the ultimate success and satisfaction of all interested parties, while ensuring the mission is accomplished.

There are several areas in which both the government and the contractor must ensure that the right conditions exist if any collaborative effort is to have a fertile ground to grow. These areas include:

1. **People:** It is management's responsibility to ensure that the right human capital is employed. Both entities must choose to allocate individuals who have the proper background and right level of experience to function effectively in this teaming effort.
2. **Framework:** Both parties must agree to a common structure in which the collaborative relationship will exist. This framework spells out the type of teams needed, who is needed on the team, the scope and authority of the team, and the team's oversight. In this case, the Manufacturing Team is made up of both Rolls-

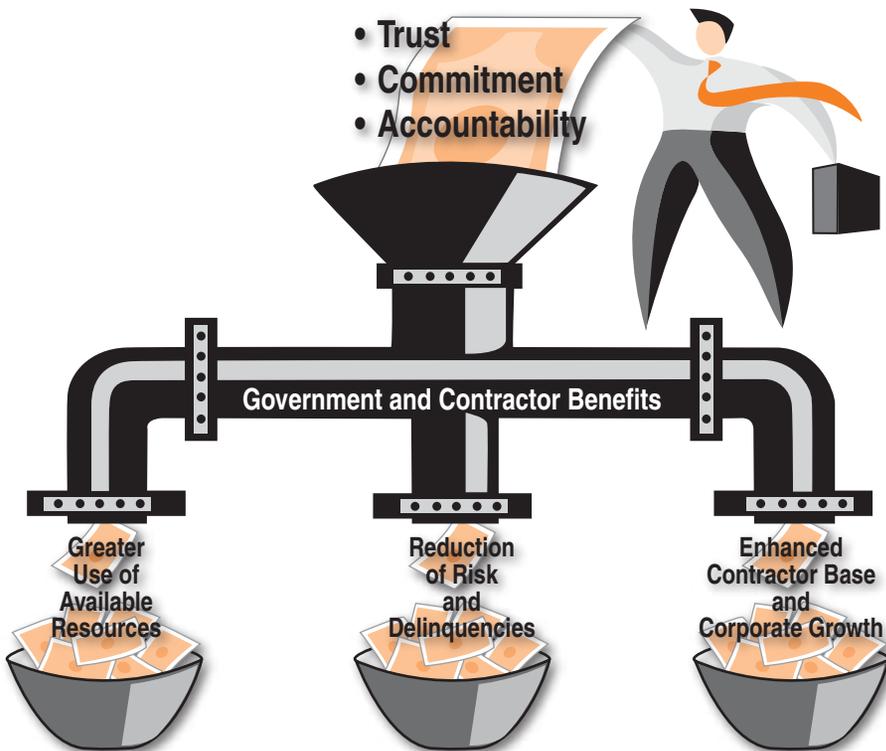


FIGURE 4. BENEFITS OF COLLABORATION AND TEAMWORK

Royce and DCMA Quality Assurance representatives while the Business and Financial Team is represented by contract and accounting members from Rolls-Royce, DCMA, and DCAA.

3. **Rules and Protocols:** These provide for a disciplined and structured approach to solving issues. Before both parties decide to join efforts as one integrated team, each team has its own set of rules and protocols to identify, work, and solve problems. This approach has often resulted in a cognitive disagreement between the teams, thus generating a psychological state of conflict. Now, both the manufacturing and business teams are aware and follow required rules and protocols, so that each team may focus on the specific issue rather than the process.
4. **Trust:** One of the pillars of success to the DCMA and Rolls-Royce collaboration experience is trust. Past interactions between the government and Rolls-Royce were plagued by both parties arriving at conclusions within a separate analytical environment. This situation proved fertile ground for distrust between the parties, because neither one had an opportunity to openly discuss specific details or particular circumstances associated with the problem. By having both teams in the same room at the same time with the right individuals, confidence and reliance on each member was established. This was reinforced through the open and honest sharing of information and the commitment of team members to work through complex issues with a common goal resulting in a heightened degree of trust and understanding.
5. **Senior Leadership Support:** Once a decision was made to establish the IPT, both teams' senior management remained engaged and closely involved in the IPT implementation and execution. Human resources were exclusively allocated and dedicated to the IPT, and team members are fully empowered to make decisions and commitments to see that issues are completely solved. This support, combined with the increased level of trust, is pivotal to the successful DCMA/Rolls-Royce teaming effort.

CONCLUSIONS

There are several characteristics that can be identified as key to the success that DCMA and Rolls-Royce have experienced through their journey to better collaboration and teamwork in support of the warfighter. Whereas in the past both teams were individually less efficient at solving issues, the new collaborative approach yields quantifiable benefits for everyone (e.g., timely delivery and financial stability). First and foremost, there must be full commitment and sponsorship from each organization's senior leadership. It is absolutely critical that each organization identify and assign the right human talent and resources. Second, there must be a clear set of rules and protocols for the team to follow. Up-front definition of

procedures, roles, and responsibilities ensures the efficiency of every team member through concentration on the issue rather than the process. This helps the team stay clear of misunderstandings and potential disappointments that can corrode the synergy, cohesiveness, and trust that takes a lot of time and effort to develop. Finally, it is absolutely necessary that the team have the time, resources, and authority needed to execute developed plans and strategies.

In conclusion, the DCMA and Rolls-Royce experience demonstrates that, when the government and contractor come together in collaboration for the positive resolution of issues, the end result is a win-win situation.

In conclusion, the DCMA and Rolls-Royce experience demonstrates that, when the government and contractor come together in collaboration for the positive resolution of issues, the end result is a win-win situation. The warfighters are provided with what they need, when they need it. The government can ensure proper expenditure of taxpayer dollars as well as a secure vendor base, and the contractor can enjoy the opportunity for corporate growth. This example of successful collaboration and teamwork can be used as the basis to develop similar working relationships within other components of DoD, particularly in the acquisition community.



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REFERENCES

DCMA vision, mission, and goals. (n.d.). Retrieved April 23, 2007, from <http://www.dcma.mil/goals.htm>

ENDNOTES

1. There are currently ten primary business systems. These include accounting, billing, budget and planning, compensation, estimating, indirect and other direct cost (ODC) internal controls, general Information Technology (IT) controls, labor, purchasing, and material management, which are audited by the government on a recurring cycle in accordance with the Defense Contract Audit Agency (DCAA) Internal Controls Audit Planning System (ICAPS).
2. Rolls-Royce is considered a “Full Coverage” contractor as described in FAR 9903.201-2 and is therefore required by Public Law 100-679 (41 U.S.C. 422) to comply with all Cost Accounting Standards specified in Part 9904.
3. The Berry Amendment, as stated in 10 U.S.C. 2533a, originated in 1941 and was established to address concerns over the procurement of domestic materials for use in U.S. military items. The Specialty Metals Clause, as stated in DFARS 252.225-7014, was added to the Berry Amendment in 1972 and addresses the use of such specialty metals as titanium, zirconium, and steel alloys in U.S. military commodities. Recent events between metal producers and Original Equipment Manufacturers (OEMs), especially the aeronautical industry, have resurfaced this statutory requirement, as well as interim governmental guidance pursuant to acceptance, exceptions, and monetary withholds based on the value of nonconforming parts.
4. Critical Safety Items (CSIs), as described in DFARS 209.270, are parts, assemblies, or equipment for aircraft or aviation systems of which catastrophic or critical failure could result in (a) loss of or serious damage to aircraft or weapon system, (b) unacceptable risk of personal injury or loss of life, or (c) uncommanded engine shutdown that jeopardizes safety. The Joint Aeronautical Logistics Commanders (JALC) have implemented specific directives pursuant to the National Defense Authorization Act (Public Law 108-136), of which Section 802 requires the Secretary of Defense to prescribe a policy for the quality assurance of aviation CSIs. Therefore, DCMA is tasked with the central role of evaluating the CSI characteristics or features that have been identified by the respective Service Engineering Support Activity (ESA). For any part that has been identified by ESA as a CSI with critical characteristics, the Product Assurance Specialist will perform surveillance activities using a Quality Release Level that has been specified within the agency’s Product Assurance Instructions and Guidance documents. If a part has been identified as a CSI but critical characteristics or features have not been identified by the ESA, DCMA is responsible for evaluating those processes that are directly related in the manufacture of the CSI and have been deemed important by the ESA.