William Forman, President and CEO of North Atlantic Industries, Inc. and George Bournazian from All Business Marketing have an informal discussion about how NAI's unique architecture meets the needs of their customers.

George: You are building Mil-Aero systems utilizing a different COTS approach than other manufacturers. Why would a customer choose an NAI solution? What makes you different?

Bill: It's about offering a smarter, faster, more efficient system design that requires complex I/O requirements—that's where we excel. As you know, there are lots of single board computers (SBCs), I/O and communications boards and power supplies on the market. Many of them meet demanding customer requirements and deliver a solid performance, often with some level of software support. Problems arise when engineers need to design a functional system around these individual boards, which often come from different suppliers. That system I/O integration is not always so easy. In fact, it usually involves making some difficult tradeoffs in terms of price, performance, footprint and time.

At NAI, we have a unique, distributed I/O architecture specifically designed for sensor-rich, Mil-Aero applications. As a result, we can offer no-compromise SWaP solutions that are designed to solve the problems encountered in demanding applications. That includes I/O density, performance, processing speed, power considerations, bandwidth and reliability, to name a few. Our customers find that they don't have to trade performance for footprint, power consumption cost or development time.

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George: What are the biggest problems your customers face and how do you help address them?

Bill: The three biggest challenges facing our customers today are time-to-mission, SWaP, and shrinking budgets. In the current environment, there is no tolerance for overruns in these areas and our products are designed to precisely address these problems.

We accelerate our customer's time-to-mission with our Configurable Open Systems Architecture™ (COSA®). Our COSA architecture provides custom solutions that are highly configurable, self-standing subsystems with off-the-shelf efficiency. Dealing with one source eliminates the need to design a custom data acquisition system, and at NAI we provide pre-tested, integrated boards and/or subsystems. As a result, instead of spending months specifying, designing, building and testing the underlying data acquisition system, our customers can immediately begin focusing their engineering efforts at the application level.

Regarding SWaP, COSA offers an extensive list of field-proven I/O offerings in a small, modular package that features greater flexibility and density than the conventional PMC/XMC design used by most rugged COTS designs. For example, on a standard NAI 6U rugged SBC, instead of providing two PMC/XMC slots, we offer customers the ability to mix-and-match up to six high-density, intelligent I/O and communications function modules. On our 3U boards, we offer the ability to mix-and-match up to three I/O and communications function modules. With the industry's widest breadth of function modules (70+ unique functions), we can meet the needs of nearly every military and aerospace system design used today. Our rugged system level offerings range from a one I/O function NANO to a Sensor Interface Unit (SIU) containing up to 15 high-density I/O or communication functions with or without an SBC. We also provide proven software to make those complex I/O features play in a complete, integrated system.

With respect to budget constraints, we can greatly reduce the customer's engineering efforts to complete the system. The adaptive nature of our COSA architecture usually requires only a quick configuration of a set of standard products to meet the customer's specification. With our rich heritage in complex I/O, we have the interface functions that support all the different sensors you are likely to encounter in a Mil-Aero application. We can rapidly mix-and-match those small interface modules on our SBCs to provide exactly what our customers need. As a result, we eliminate non-recurring engineering (NRE) fees to configure a system. Because our products are delivered as complete pre-integrated, fully tested systems, the deployment cost and time savings are immeasurable and significant.

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George: What about the aspect of long-term viability?

Bill: The rapid rate of component changeover associated with the commercial market is a concern. It forces Mil-Aero program managers to constantly track the market to deal with product obsolescence. NAI addresses this by providing complementary engineering and support processes designed to ensure long-term viability of our products in Mil-Aero applications. In addition, the modular nature of our COSA architecture provides both exceptional longevity and maximum flexibility as subassemblies and even complete subsystems can be upgraded without requiring a complete system redesign. This is an especially attractive feature to organizations faced with shrinking or tightened budgets.

George: Talk to me about "supportability" considerations. How do you accommodate technology evolution?

Bill: In general, the lifespan of commercial hardware and software is significantly shorter than the lifespan of most military programs. This forces military program managers to develop specific timelines for COTS insertions and upgrades to meet changing program requirements. At NAI, we design with technology insertion cycles in mind. We think about the impact of form, fit and function in the context of Mil-Aero lifecycles. One of our overarching design goals is to ensure that our customers don't have to design "around" our systems to meet changing mission requirements. We believe that technology refresh and insertion cycles can be accomplished with seamless transitions in functionality, performance and support.

One example where we accelerated the upgrade of an older airborne system with our COSA architecture was with Support Systems Associates, Inc. (SSAI) in Warner Robins, GA. They had a short

timeframe requirement to supply a replacement Loader Weapon Control Panel and Electronic Control Unit on the AC-130U Gunship. The I/O intensive 3U cPCI systems required A/D, D/A; Synchro/LVDT measurement and simulation; MIL-STD-1553; multiple RS422 functions; highly programmable discrete I/O; a "bare metal" BIT-enabled processor that did not require a BSP, and a PICMG 2.11 compliant 3U EMI certified 28VDC PSU. The conduction-cooled solution we provided allowed the customer to fully meet all of the system requirements in two, small 3U cPCI chassis within their budget and in the allotted timeframe.

Cliff Driver, SSAI Vice President of Operations, stated, *"The final flight test results of the new ECU/LWCP system exceeded the requirements and improved the overall accuracy of the Gunship, as well as the reliability and maintainability of the gun systems – resulting in real benefits to USAF war fighters."*