

**Linda P. Hudson**  
**President**  
**Land & Armaments**

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**Testimony Before The**  
**House Armed Services Committee**  
**Seapower and Expeditionary Forces Subcommittee**  
**Air and Land Forces Subcommittee**

**November 8, 2007**

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**President**  
**Land & Armaments**  
**BAE Systems**

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Linda Hudson assumed the leadership of BAE Systems Land & Armaments Operating Group on January 2, 2007 with her appointment as President. She leads a global land vehicle and armaments business with primary operations in South Africa, Sweden, the United Kingdom and the United States of America.

Prior to joining BAE Systems, she served for seven years as an officer and vice president of the General Dynamics Corporation and she was the President of General Dynamics Armament and Technical Products in Charlotte, NC.

From August 1997 until May 1999, Ms. Hudson was Vice President, Business Development at General Dynamics' corporate headquarters in Falls Church, Virginia. In this position she was responsible for developing and implementing new business growth strategies across the corporation.

Ms. Hudson served as President, General Dynamics Ordnance Systems, from April 1992 through July 1997. As the chief operating officer of this wholly owned subsidiary, Ms. Hudson managed a broad range of products and operated government – owned manufacturing facilities. She led this organization while corporate ownership changed from Martin Marietta to Lockheed Martin and through its subsequent acquisition by General Dynamics.

In November 1985, Ms. Hudson joined Martin Marietta in Orlando, Florida. She held a variety of positions there including Director, Air Defense Production Operations and Program Director, Electro Optical Systems before being appointed to head the Ordnance Corporation in 1992.

Ms. Hudson began her career in 1972 at the Harris Corporation in Melbourne, Florida as a Research and Development Engineer, specializing in satellite and communication systems. She progressed to a Senior Engineering position in Reliability Design Analysis and Component Failure Analysis. In 1976 she joined Ford Aerospace and Communications Corporation in Newport Beach, CA. During her tenure at Ford Aerospace she was a Reliability Engineering Manager, Division Quality Assurance Manager and Air Defense Systems Program Manager.

A graduate of the University of Florida, Ms. Hudson received her bachelor's degree, with honors, in Systems Engineering.

## ► **Introductory Comments**

Chairman Taylor and Chairman Abercrombie, ranking members Bartlett and Saxton, distinguished members of these subcommittees, I thank you for the opportunity to appear before you today regarding the Mine Resistant Ambush Protected (MRAP) Systems produced by BAE Systems. Before beginning, on behalf of BAE Systems, I would like to thank the subcommittees and this Congress for your support of the MRAP program. This is a noble endeavor which has brought together a powerful government-industry team to protect our troops in harms way.

The following sections present a brief company overview, a summary of our three MRAP programs currently in production and responses addressing the four areas identified in your October 24, 2007 invitation to testify. The list of federal contracts that BAE Systems Land & Armaments has had with the federal government for the past three years was submitted to the committee under separate cover.

## ► **Company Overview**

As the President of BAE Systems' Land & Armaments Operating Group, I proudly speak for our global enterprise and our 18,000 employees. While we are headquartered in Virginia, Land & Armaments operates in 17 states, the United Kingdom, Sweden and the Republic of South Africa. We design, produce, maintain, reset, and upgrade combat vehicles, tactical vehicles, military armaments, naval fire support systems, advanced armor solutions and individual soldier survivability systems for the United States and our allies. Here in the United States, you will recognize many of our products beyond the MRAP; such as the Bradley Fighting Vehicle, the Paladin, the M88 Hercules Recovery Vehicle, the Family of Medium Tactical Vehicles, the M777 Lightweight Howitzer, the Advanced Gun System for DDG1000, and the Marine Corps Amphibious Assault Vehicle. We have played a major role in recent initiatives to improve warfighter survivability by up-arming HMMMV's and providing advanced body armor on an accelerated schedule. We proudly support the men and women of our Armed Forces.

► **MRAP Product Overview**

On the MRAP Program, BAE Systems is currently under contract to provide the following MRAP variants.

- **RG31** – BAE Systems has been building the RG31 mine resistant vehicle since 1996 in our Land Systems South Africa business. This was one of the original, ground breaking, v-hull systems developed to counter this challenging threat. BAE Systems entered into a business relationship with General Dynamics to market the RG31 in the United States and that agreement continues for the MRAP program. Since 1996, 417 vehicles have been sold to US Forces. Our legacy of designing and manufacturing mine resistant vehicles in South Africa goes back to 1977.
  
- **RG33** – Building upon our RG31 experience in South Africa, technology was transferred to our Ground Systems business in the US and a next generation mine resistant vehicle was developed by BAE Systems incorporating unprecedented survivability features.
  
- **Caiman** – In July, 2007 BAE Systems acquired Armor Holdings. This acquisition added an MRAP variant, called Caiman, based upon the design of the US Army's Family of Medium Tactical Vehicles (FMTV) to the BAE Systems portfolio. In addition to meeting the MRAP survivability requirements, this vehicle has been designed to provide parts commonality with the FMTV. This commonality results in proven reliability and ease of supportability with available spare parts and trained field support representatives already in Theater.

In addition to being focused on MRAP production activities, BAE Systems developed, qualified, brought capital tooling online and initiated production of an EFP (Explosively Formed Projectiles) armor solution. This armor is not only applicable to all MRAP vehicles but can be applied to other vehicles in Theater as well.

Recognizing the importance of system sustainment, we have purchased spare parts in advance of contract award and established a single forward deployed BAE Systems Program Manager to support fielding and sustainment activities. Two BAE Systems senior executives traveled into Theater to assess the infrastructure needs of our field service teams and to ensure successful fielding and seamless support to the warfighter. We have actively supported the establishment of MRAP University at the Red River Army Depot and are collaborating with the other MRAP contractors to cross train Field Service Representatives (FSR's).

► **MRAP Scope, Timelines and Funding Adequacy**

As discussed above, BAE Systems Land & Armaments is currently manufacturing the RG31, RG33, and Caiman MRAPs. All three of these variants were designed and developed using internal company funding, including generating requirements and developing company owned technical data packages (although it should be noted that Caiman's automotive design is identical to the FMTV and that Technical Data Package is owned by the Government).

- **RG31** – Land & Armaments is presently under contract to General Dynamics Land Systems (GDLS) to provide RG31s in support of the MRAP program. Therefore, I will defer to my GDLS colleague to provide specific information regarding that contract. To date, Land & Armaments is contracted to supply 624 RG31s to GDLS. In order to maximize production capacity and to accelerate deliveries, Land & Armaments licensed GDLS to build 295 of these

vehicles while the balance is being built in South Africa. Production vehicles are planned to begin delivery this month and be completed in February 2008.

- **RG33** – Land & Armaments is currently under contract to deliver 1,135 RG33s. Thus far, 32 Category I and 77 Category II MRAPs have been delivered. These RG33s are in multiple configurations, to include an ambulance and SOCOM variant. This August, deliveries were completed on the first two delivery orders. These RG33s began arriving in Theater three weeks ago.

As a newly designed vehicle, the RG33 encountered a number of test anomalies requiring design modification early in the program. Working with the Joint Program Office, those deficiencies were corrected and successfully retested. The need to incorporate those design changes in our concurrent production line caused some initial production delays. The multiple configuration variants of the RG33 also exacerbated the production start-up challenges. However, those problems are now behind us and our production is ramping up as planned. The first RG33 was delivered two months after contract award and five months after the start of design. Current production runs through April, 2008.

- **Caiman** – Land & Armaments started delivering production Caiman vehicles six weeks after contract award in July 2007. Of the 1,174 Caimans under contract, 145 have been delivered. Given the breadth and depth of the automotive, armoring, and manufacturing experience resident within our Mobility and Protection Systems business (formerly Armor Holdings) and the commonality with the on-going FMTV production, the transition to production and subsequent fielding was executed smoothly for Caiman. Without a follow-on contract in place, the ongoing production run will end in February 2008. It should be noted that sufficient capacity exists at our Sealy,

TX facility to meet all known FMTV production requirements in addition to MRAP requirements.

- **Adequacy of Funding** - From Land & Armaments' perspective, funding for the MRAP has been adequate to meet the identified need. Congress, OSD and the Services should be commended for recognizing this critical need to protect our troops in the field. If possible, to achieve and sustain our maximum production rates, it would be helpful to have the following:

- More insight into planned acquisitions
- Larger quantities ordered at one time (rather than piece meal orders) – a minimum delivery duration of nine months will avoid the ramp-ups and ramp-downs we presently experience to get better value and responsiveness from our supply chains
- Orders placed within our lead time windows to preclude unnecessary and wasteful breaks in production
- Long lead funding for critical items, as currently used on programs like the Bradley Fighting vehicle, in order to mitigate risk and maximize production capacity.

As a point of information, if no further orders are received by early December, the RG33 and Caiman production lines will cease production in April and February 2008, respectively.

► **BAE Systems Industrial Capacity**

Land & Armaments is rapidly ramping up its production capacity at its five principle MRAP manufacturing sites: York, PA; Aiken, SC; Sealy, TX; Fairfield, OH and in Johannesburg, South Africa. The following table depicts the present and planned contract MRAP production rates for our three vehicle variants.

<b>MRAP Variant</b>	<b>Planned Nov 2007 Production</b>	<b>Max monthly production (current contracts)</b>
RG31	60	120 (Feb 2008)
RG33	68	300 (Apr 2008)
Caiman	195	376 (Jan 2008)

Activity is underway to ensure that components of our MRAP variants can be built in all of our major facilities. Planning is in place to allocate production to maximize throughput and deliveries. Additionally, we have used and will continue to use our subcontractor base to augment fabrication and assembly capacity. With six months lead time, the RG33 can be produced at a maximum rate of 400/month and Caiman can be produced at a maximum rate of 700/month. Given sufficient insight into upcoming requirements, Land & Armaments will make further capital investments to increase capacity and self-fund long-lead items in anticipation of contract award. Our Sealy, TX operation could reach the maximum monthly Caiman output without negative impact to our FMTV production. Lastly, we stand ready to further expand monthly MRAP production by allowing other manufacturers to produce our MRAP design variants under license.

Reaching and exceeding the above production rates has not been without difficulties. It has been necessary to rapidly increase our manufacturing work forces with a special emphasis on critical skills like automotive mechanics and welders. Significant attention to staffing and training has effectively managed this risk. Our supply chains have paced the initial production ramp up and continuing supply chain risks for the RG33 and Caiman are summarized in the following paragraphs.



**RG33:**

While no suppliers are currently delivering behind schedule, axles have been the limiting factor with RG33 production ramp-up. We have established a second axle supplier to help alleviate this situation. The following suppliers are considered critical to the planned schedule ramp-up going forward. Numerous actions are underway to mitigate performance risk with the suppliers.

- AF Technologies, TX; Electrical harnesses
- Arvin Meritor, MI; Axles
- AxleTech, MI; Axles
- Algoma Steel, Ontario Canada; Steel Plate
- Mittal Steel, PA; Steel Plate
- Oregon Steel. OR; Steel Plate
- Sechan Electronics, PA; Electrical components

**Caiman:**

Currently no supplier is causing late deliveries. The following suppliers are considered critical to the planned schedule ramp-up going forward. Numerous actions are underway to mitigate performance risk with the suppliers.

- AM Tank, OH ; cut panels for armored floor, doors and sidewalls of the armored capsule. To mitigate the risk we are qualifying two more suppliers: Castle Metals OH and W. Industries MI.
- Real Time Laboratories, FL; air conditioning/filtration units
- Diamatrix, AZ; small fabricated parts

It should be noted that certain key elements such as turrets, armored glass and spall liner material are supplied from within BAE Systems and do not constrain delivery. By using the standard FMTV chassis and automotive drive train, 85% of the Caiman supply chain is available, qualified and mature.

The Department's application of the DX rating to the MRAP program and the waiver of provisions of the Buy America Act were quite helpful in meeting the urgent demand. These actions allowed us to leverage our worldwide supply chain and use our experienced operations in South Africa. We appreciate the Government's efforts.

► **Coordination Between BAE Systems and MRAP Program Office**

We would like to single out the MRAP Program Manager, Mr. Paul Mann, for his leadership and unceasing efforts to field MRAP. We have maintained an open, direct and professional relationship since the inception of MRAP. For the RG33 and Caiman vehicles, we have been in direct contact with Mr. Mann and his personnel continually at all levels within Land & Armaments. This coordination is essential and provides frequent feedback. Normal contractual practices could not possibly keep up with the fast pace of this program. Both the Program Manager and BAE Systems have had to rely on timely communication, joint problem resolution and quick implementation of fixes to meet the urgent needs. This collaboration, within the framework of the contract, deserves commendation. The selfless actions by all involved have been crucial for so much to have been accomplished in such a short time.

► **Willingness to Communicate and Interact with Other MRAP Suppliers and to Share Best Practices**

Land & Armaments is prepared to collaborate with all MRAP prime contractors to improve survivability; accelerate production and fielding; and enhance sustainment of MRAP vehicles. We have already collaborated with the other MRAP prime contractors to cross train our field service representatives on all vehicle variants to optimize in-theater support. As previously mentioned, we have already licensed General Dynamics to build the RG31. Earlier this year, our Sealy Operations assisted Force Protection in Cougar assembly. Land & Armaments has previously collaborated with Force Protection on the Iraqi Light Armored Vehicle program and are currently collaborating with

Navistar International on the upcoming Joint Light Tactical Vehicle program. We have demonstrated the ability to optimize our performance by taking the best capabilities among our companies within the Land & Armaments Operating Group and we stand ready to work with our industry colleagues to better meet the needs of our troops.

In closing and on behalf of the BAE Systems Land & Armaments team, I thank you for the invitation to come tell our MRAP story. BAE Systems has been leaning forward, often self-funding activities in advance of contract, with the sole focus of rapidly delivering the most survivable vehicles possible to the warfighter. We are proud to be a major part of the MRAP team and are well positioned to respond rapidly to future program needs.