

# IBD Seeks Paradigm Change in Vehicle Protection Technology

## Interview with Ulf Deisenroth, President of IBD Deisenroth Engineering

defpro.com | IBD Deisenroth Engineering has seen a remarkable development since the 1980s and established itself as a key developer, manufacturer and supplier of survivability systems and solutions. As one of the few European companies that gained a long-lasting foothold in the US market, IBD protection technology can be found on a large range of armoured military vehicles and significantly helps to increase the soldiers' safety in operations abroad. To provide the readers with an insight into the company's extensive activities in the field of vehicle protection Luca Bonsignore and Nicolas von Kospoth of defpro.com talked to Friedrich Deisenroth, President of IBD Deisenroth Engineering.

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**defpro.com:** How did the relatively small centre of excellence that is IBD Deisenroth become the successful business that it is today?

**Ulf Deisenroth:** When we founded IBD Deisenroth in 1981 we filled a gap in the German market between traditional manufacturers of protection technology and research institutes. This was supported by the German Ministry of Defence in order to realise and to provide new technologies faster than was done before by industry and research institutes. It turned out to be very successful, and shortly after we developed the armour for the Leopard 2 main battle tank (MBT). Since then, everything has developed quickly. IBD has always focused on the development, the prototyping and the subsequent licencing to manufacturers. This is why today many of the largest members of the German industrial landscape, such as Krauss-Maffei Wegmann and Rheinmetall, hold licences from IBD Deisenroth.

With the outbreak of the Yugoslav wars in the 1990s, a number of customers, for whom we had already been carrying out various developments, told us that they needed new solutions and the delivery of a certain number of kits. However at the time we were not in the position to produce larger quantities. This led to the founding of the CHEMPRO GmbH which began to produce the required kits while IBD Deisenroth could continue to focus on research and development.

The business model of the licencing of solutions evolved quite well. Today we have 42 licence holders throughout the world, including a large number of governments. Then we began to contribute to large defence programmes such as, for instance, Sweden's procurement of the Leopard 2. In this particular case, we worked together with a Swedish company which partly produced the protection on its own. This company, Akers Krutbruk Protection AB, became part of IBD Deisenroth. This has also been the case in Canada and with other customers, where project companies were transformed into producing companies. This is how the IBD group has grown to become the family of companies it represents today. Now we have subsidiaries in Sweden, Canada, France and Greece. Furthermore, we still hold 49 per cent of the CHEMPRO GmbH while Rheinmetall holds the other 51 per cent. Today some 250 employees are working in the IBD group.

**defpro.com:** The most significant change in the company structure occurred with the sale of CHEMPRO shares in 2006 and the founding of the ADS GmbH. What was the background for these strategic decisions?

**Deisenroth:** CHEMPRO grew extremely fast. We almost doubled our turnover each year. The large volumes handled by CHEMPRO and the requirement to participate in larger series

productions called for a partner who was well positioned in the international market and which, at the same time, could support the expansion of the company. This was the main reason for the sale of CHEMPRO shares to Rheinmetall.

ADS had to be founded because we increasingly went beyond the traditional development activities of IBD into the manufacturing of prototypes and the application on the vehicles. Therefore, it was essential to move these activities to an independent company, which then could concentrate its competence in this particular sector.

The decision to involve Rheinmetall in the founding of ADS with a 25 per cent share was due to Rheinmetall being able to provide significant know-how in the industrialisation as well as technical assistance.

**defpro.com:** The flexibility of the early years may have been one of the decisive characteristics which allowed IBD Deisenroth to establish itself alongside with the major defence companies. Would you say that this continues to be an advantage in the hotly contested vehicle protection market?

**Deisenroth:** Yes, this is something that we retained throughout the years. However, this is only possible when you have a small family-owned company in which decisions can be made fast. Sometimes this may be done against economic interest but, rather, aims at the benefit of the customer as well as the soldiers who rely on our protection technology. Our principle is to react quickly and to support our customers when they are under pressure.

Currently we have 14 customers who operate some 4,000 vehicles in Afghanistan using our protection technologies.

**defpro.com:** You mentioned Afghanistan as a key topic. Many vehicles in Afghanistan are equipped with IBD protection technologies. Do you receive direct feedback along with information about lessons learned from users – not the industry but, rather, the military – operating in conflict areas such as Afghanistan?

**Deisenroth:** Yes, we are in direct contact with users. Therefore, we have a very good idea of how the threats and the situation in theatre changes. We personally receive information on current threats and, based upon this information, we re-engineer threats and test our new protection concepts. This is how we see what can be achieved. Thereby, we have a lot of valuable information and very precise knowledge about the current threat situation which enables us to adapt our protection concepts. It is our particular strength to provide actual protection solutions, which remains quite unrivalled.

**defpro.com:** Is there a general difference when you equip a vehicle for asymmetric or for conventional operations?

**Deisenroth:** Very good examples are the conventional main battle tanks deployed to Iraq and Afghanistan. Principally designed and equipped for conventional wars – tank against tank – they bring along the typical and massive weak points as regard to the threats of an asymmetric theatre: the insufficiently protected sides, bottom and roof. The conventional concepts are absolutely inadequate for today's threats. Therefore, the vehicles are extensively retrofitted, resulting in an extreme increase in weight, with main battle tanks exceeding the 70 ton mark. Consequently, the vehicles' manoeuvrability is limited, the wear increases severely and maintenance as well as associated requirements cause huge problems. This is where our Evolution concept applies. We have offered this concept for quite some time. It is to bring about a

paradigm change in the vehicle protection sector, as increased protection coercively entails an increase in weight.

**defpro.com:** Using the Evolution concept you managed to provide a protection solution for medium weight vehicles, which has already been used for the Leopard 2A4.

**Deisenroth:** The philosophy of the Evolution concept is quite simple. There are a number of extraordinary older platforms, such as the Leopard 2A4, which have been and are still being sold in great numbers. The Leopard 2A4 is a very good platform, but its protection is inadequate for today's threats.

There are two ways to change this: one is to remove the old protection, apply a new one and try to adapt the vehicle to the current requirements. This is what we have done with our technology for the Leopard 2A5. However, this particular protection concept results in very heavy tanks, weighing close to 70 tons.

We thought that a different approach was required. Within the Evolution concept we use the original armour of the vehicle and apply state-of-the-art protection concepts which synergistically interact with the original armour. Synergistic means that the performance of each of the individual technologies is exceeded by the interaction of both technologies.

The synergistic concept, which has always been our approach, allows converting older platforms with a very good basic structure to achieve extraordinary good protection concepts. The Evolution concept can be applied to all vehicle types in use. For instance, take a look at the German Fox, an armoured 6x6 vehicle: Almost nobody realises that this is one of the best-protected vehicles within the range of light vehicles deployed to Afghanistan. The Fox is a typical example for the Evolution concept which allows to keep a basic platform in service for a longer time and with a very high level of protection. Currently, many of our customers' operating older vehicles are upgraded with new technologies. But to do it successfully you need very good new and unprecedented protection technologies. This means you have to turn towards material technology development – which is one of our strengths – and you need new concepts. You won't get far with conventional protection concepts.

One solution is ADS, the other in the passive protection sector is in the field of nano-technology. We started development very early in this field of technology comprising metals, ceramics and fibres. Fortunately, this allows us, at exactly this crucial moment, to introduce new protection technologies. This fact leads to the significant success of the Evolution concept. The vehicles are not overloaded but are kept within the required weight classes.

**defpro.com:** As you explained, the Evolution concept is based on many different interacting components. To what extent does it remain a modular concept?

**Deisenroth:** Modularity plays an important role with IBD solutions. This is where our AMAP (Advanced Modular Armour Protection) concept applies, in which we combine many different technologies, one of our key capabilities being a system provider for protection. There are always several technologies available for the same application. We generally apply a modular design such that the customer is able to adapt the protection to any situation, anytime, without having to buy an entire new protection solution for the vehicle.

We can equip certain areas of the vehicle with new technologies and replace existing protection if required. All this can be accomplished within the aspects of synergy and weight reduction. There are a large number of very good examples demonstrating the huge advantage for our customers not having to buy an entirely new protection system. We replace components and thereby

achieve significantly better protection without any increase in weight. That's the general idea of the concept.

**defpro.com:** Which markets are you looking at concerning the Evolution concept?

**Deisenroth:** We are currently working in more than 20 countries. The Evolution concept is very well received by our customers. It allows them to keep a well-protected vehicle in service at reasonable costs until new vehicles, currently under development, are introduced into service. We simply take an aging vehicle and mount new technology on it – that is all.

We are not only in direct contact with numerous customers, but are already delivering advanced solutions that have resulted from the Evolution concept. 15 years ago we applied solutions for the same vehicles with much heavier weight. Today it doesn't add weight while still providing exceptionally good protection. It now complies with today's indispensable weight requirements. That is the immense advantage of the new technologies.

**defpro.com:** Your portfolio consists of many products: from IED and heavy blast protection to active defence systems. However, you have never added the field of reactive armour. Was this a strategic decision?

**Deisenroth:** This has historical reasons. Reactive armour was very topical from 1983 to 1985 and has been intensively studied by the German Ministry of Defence during those years. At the same time, the further development of passive protection was pushed. Reactive armour has seen development in many countries. Also Germany spent a lot of money for studies on this protection technology.

However, the result has been that the advantages did not compensate the disadvantages. Consequently, Germany decided to invest in the further development of passive armour, which in the end proved to be the right decision as you can see today. Therefore, Germany still is the absolute leader in passive armour technology worldwide.

Indeed, reactive armour has gained importance in recent years and certain disadvantages have been eliminated. However, fundamental disadvantages remain. Most notably, reactive armour cannot provide 95 per cent coverage of protection on a vehicle. All new specifications contain requirements which can only be met with the use of passive armour. Even though reactive armour may be an advantage with respect to weight requirements, nevertheless, we still do not believe in this solution.

**defpro.com:** Can you tell us what the current status of IBD Deisenroth's Active Defence System is?

**Deisenroth:** This year, we are involved in a very intensive vehicle equipment programme for which we have already delivered the pre-series vehicles. Furthermore, the series preparation for different projects has been completed. This year and next year we will produce the first small series. Currently, we are under contract for the ADS with seven countries where we are in different stages of realisation. Our first and oldest customer is already entering the production phase.

Therefore, we are currently completing the safety documentation – being a precondition for the system introduction – for many countries, including Germany. At the same time, vehicles are equipped for troop evaluation allowing soldiers to make their first experience with a completely new protection solution. The advantage of our approach is that we test the system on the actual vehicles. We have a set of troop prototypes that are proceeding with great success so that we are

very optimistic to introduce the system in 2009/10. You will be able to see the equipped vehicles available to troops soon, as some have already been delivered and will be deployed to one or the other theatre shortly.

However, it remains a very complex matter. In particular, the safety documentation, which is required for such a protection system, is not easy to compile. Moreover, it is a completely new technology for which no standards and basic principles have been established so far. On the one hand there are no standards, such as STANAG, and on the other hand existing standards cannot be applied. But apart from these difficulties, which are normal for new technologies and solutions, everything is proceeding well and, altogether, we are very satisfied.

**defpro.com:** Would the next logical step, then, be a concept for light armoured vehicles, such as for the vehicle class of the IVECO LMV?

**Deisenroth:** IVECO's LMV is a typical example of the latest state-of-the-art vehicle, which has been designed and built in accordance with the above-mentioned aspects of weight reduction and survivability. IVECO continuously develops its solutions on a modular basis. The level of protection permanently rises without any increase in weight due to the introduction of new technologies. With these new technologies we create a higher level of protection than existed before, however, without overloading the vehicles. Therefore, the status of development is constantly in motion, including the very important aspect of mine protection. This is especially due to a remarkably modern vehicle concept which is of great advantage to the customer.

This also applies for other light vehicle concepts in which we co-operate with IVECO and which are very effective. Today you can create vehicles that were not conceivable within the present scope of weight and protection. Now these vehicles are built and are most successful. Currently, eight nations are operating the IVECO LMV with outstanding success in Afghanistan.

**defpro.com:** Are you involved in each of the programmes for these nations?

**Deisenroth:** Sure! And there are many good examples of this such as, for instance, in the USA. The M1117 Armoured Security Vehicle (ASV) is comparable to the LMV. It has a very modern architecture and was developed together with us. Today this is one of the most successful vehicles in the US Army in terms of survivability. Meanwhile, due to the modular adaptation of protection solutions, US vehicles are protected at a level which was not conceivable before.

**defpro.com:** Not many European companies were able to gain a foothold in the US as IBD Deisenroth has. Could you outline your position in this particular market with some figures?

**Deisenroth:** So far, we equipped some 2,700 Stryker armoured combat vehicles and are constantly producing additional kits. We also delivered protection kits for approximately 2,500 ASVs. In the US market we are involved in almost all major vehicle programmes, except for the MRAP programmes. The latter is a very political field for which you must have a US-based company to become involved. However, we successfully support the other vehicle programmes from Germany. For example, we equipped the ASV with state-of-the-art protection technology, including the ADS. This vehicle is now involved in different major tenders in several countries, making us confident that this platform has a very good future.

**defpro.com:** The RPG-7 is still one of the most lethal weapons which can currently be encountered in conflict areas and which our vehicles are exposed to. Russia is now developing a RPG-30 which uses a tandem-shaped charge warhead with a pre-fired decoy rocket to overcome

Western-built active defence systems. How do you react to such news and is your system ready to meet this new threat?

**Deisenroth:** Obviously, Russia knows its own systems very well. Russia was one of the first countries to develop an active defence system and of course now senses a business opportunity for solutions which overcome modern protection systems. And to be honest, I must say that the approach of the RPG-30-system is very smart and will definitely be effective against a certain type of active defence system.

However, our system has an architecture different from most active defence systems. It is a very extensive and modern architecture which, from the beginning, has been developed with the anticipation that such a threat may emerge someday. Therefore, we do not feel that this affects us.

**defpro.com:** What are further steps in the development? Will it possibly move towards even lighter protection solutions?

**Deisenroth:** The material technology which is currently developed in different locations will boost the entire protection sector. It will still take a while. But, for example, the field of body armour will take a big step forward due to this improvement in technology. Today's soldiers are overloaded and there are still no real new concepts for body armour. The future will bring a total change of concepts which will allow for providing a better level of protection at a lower weight.

This will be comparable with the development of future vehicle protection. The key for this will be the material technology. Furthermore, modern protection systems such as ADS will raise the level of protection and also improve weight reduction. Nevertheless, this has always to be seen in combination with modern passive armour technologies. This combination will lead to astonishing solutions in the course of the next few years.

For years we struggled for an improvement of 5 to 10 per cent, and today we make tremendous technological leaps which represent an increase in the level of protection by up to 50 or even 100 per cent, when compared to the general state of current technology. This is particularly due to modern materials. Once introduced into the production process they will lead to significantly improved solutions. The "proof of principle" has already been accomplished with fibres, ceramics and similar materials. Whoever focuses on this field of technology will certainly have the necessary long-term success in the protection sector.

Armed forces will be able to keep vehicles in service which today are insufficiently protected. At the same time, new generations and new classes of highly protected vehicles will be created, which are inconceivable today. This will be a giant market.

**defpro.com:** Thank you very much, Mr. Deisenroth.