



SIMULATION



TRAINING



SUPPORT PRODUCTS



InterActions

JUNE 2013 – # 26

NH90 SIMULATION
SOGITEC AT THE HEART OF
OPERATIONAL CHALLENGES



NH90 SIMULATION

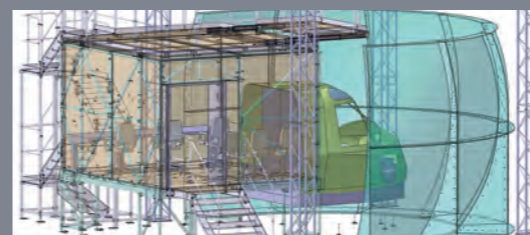
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Editorial



"A RANGE OF NEW PRODUCTS AND SERVICES CLOSER TO OUR CLIENTS' OPERATIONAL NEEDS AND CONSISTENT WITH CURRENT NATIONAL BUDGETS"

ANDRÉ PIATON
CEO Sogitec Industries

After so many years during which Yves Fouché, through this editorial, gave us his insightful vision of the simulation and technical publications world, the faithful *InterActions* reader is certainly surprised to discover a new signature. After 26 years as Chief Executive Officer, Yves has yielded his position to spend days that we would not dare call quiet when one knows the man and his indefatigable action.

During his entire time as CEO, Yves' involvement was full, he has never stopped struggling for the company to live and grow. He elaborated a constant strategy of technological progress and often was a precursor, for instance in the field of image generation.

Even through tough phases, he always led a resolute policy of investment which was consistent with his technological progress strategy. He succeeded in anticipating market shifts and being ready with products meeting operational users' new needs.

Finally, with charismatic action, he managed to get and keep together highly capable and devoted teams to conduct numerous projects he initiated.

As he steps down, Yves Fouché bequeathes a treasure made of technological know-how, on-going programs and passionate women and men. All these assets are going to allow us to continue his action based on innovation to offer a range of new products and services that fully takes into account materiel and their missions evolutions, hence closer to our clients' operational needs and consistent with current national budgets.

These principles' practical implementation is illustrated through this issue's articles. In particular, you will read why and how, to respond NH90 crews' need for training, the MRTD (Medium Range Training Device) has emerged, how new technologies have allowed us to offer mobile solutions (FalconSphere® - EFB, eTouch Companion™), which processes were created to automate 'supplemental' technical publications' production, and the approach Sogitec has chosen to revamp maintenance simulators.

I invite you to visit our booth at the next Paris Air Show where I will have the pleasure to welcome you from Monday, June 17, on.

See you soon!

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Marketing and Sales
4, rue Marcel-Monge - Immeuble Nobel
F - 92158 Suresnes cedex
Tel.: 33 (0)1 41 18 57 00 - Fax: 33 (0)1 41 18 57 18
Email: contact@sogitec.fr
www.sogitec.com
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NH90 Simulation

SOGITEC AT THE HEART OF OPERATIONAL CHALLENGES

- P. 4 - An innovative business model for NH90 training tools
- P. 5 - Simulators at the edge
- P. 8 - Operational points of view

End of January 2012, NAHEMA awarded Sogitec a contract for the delivery of 6 simulators and training devices to the French Army and Navy. In early 2013, the trust placed by French Forces in Sogitec's hands was confirmed by the Finnish Army for the delivery of an additional trainer. Beyond the commercial success and technical challenge, Forces' daily purposes will be transformed by owning new tools.



NH90 — 14 nations and chosen versions

(in italic are the nations which have already selected or having been delivered their training means) **TTH** **NFH**

	Germany	●	●
	Australia	●	
	Belgium	●	●
	Spain	●	
	Finland	●	
	France	●	●
	Greece	●	
	Italy	●	
	Norway		●
	New-Zeland	●	
	Oman	●	
	Netherlands		
	Portugal	●	
	Sweden	●	



AN INNOVATIVE BUSINESS MODEL FOR NH90 TRAINING MEDIA

Launched by four Nations (France, Germany, Italy and the Netherlands) in the early 1990's, the NH90 program was already seen as innovating then. Program management was indeed, on behalf of participating Nations, put in the hands of a NATO agency, the NATO Design and Development, Production and Logistics Management Organization (NAHEMA), a privately-operated agency able to contract with NH90-involved industrial partners, the main one being NHIndustries (Eurocopter, AgustaWestland and Fokker). The simulation and training systems' part of the program obeys to similar rules. After its selection by French, and then Finnish, authorities, to provide NH90 training tools, Sogitec was awarded a contract by NAHEMA.

A media at the heart of the solution adopted by French and Finnish Forces

Even if simulators have already been delivered to Forces operating NH90s, the NAHEMA-Sogitec contract results from specific analyses towards Forces' requirements and needs. NH90 Sales Manager Jacques Bonot notes that if "it re-

mains difficult, within current budgetary constraints, especially for Nations operating small fleets, to procure an FMFS (Full Mission and Flight Simulator)", this stands as the best media despite supposedly higher procuring and operating costs. This is why the French Army chose to procure an FMFS for its Training School at Le Luc.

On the basis of additional training needs analyses conducted by the French Army and strongly supported by Sogitec Industries and its deep understanding of operational needs, the MRTD (Medium Range Training Device) concept has emerged (read p. 5). This type of media is eventually at the heart of the solution adopted by French, and subsequently Finnish, Forces, and, like the FMFS, allows for a wide range of missions.

Establishing a single procurement process for simulators

Once the specifications for a moderately expensive tool to be procured under tight budget constraint were drawn, the adopted business model could be implemented. NAHEMA-led management is advantageous as it establishes a single procure-

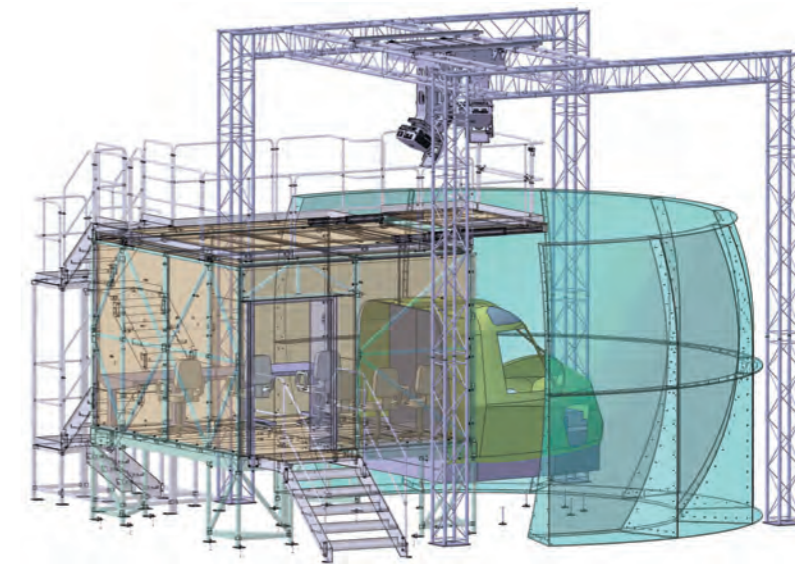
An atypical helicopter program, both industrially (Eurocopter -AgustaWestland-Fokker consortium) and, from a French point of view, in terms of management (NATO agency), the training media aspect of it is also submitted to the goals of worksharing, establishing partnerships and rationalizing. To achieve them, Sogitec stands as a reliable—and soon-to-be referential—partner.

ment process for helicopters, that is valid for all Nations. This is true for support products as well, including simulation and training devices. This way, design and development costs are shared whereas Nations remain solely responsible for the production costs of the devices they procure. Sogitec fully sticks to this philosophy and gains significant competitive advantage from it.

Hence are established:

First, a long term partnership between Sogitec Industries and NAHEMA paving the way for other nations to join the initial contract signed for France, as Finland did after a year (including full support for over ten years for French Forces);

Second, a true price catalog allowing future clients to closely plan and monitor procurement to come. ■



SIMULATORS AT THE EDGE

Rich from more than thirty years of experience in flight simulation, Sogitec teams are now at work to provide several Nations' Armed Forces with among the highest-performance training tools for new generation helicopters.

MRTD (Medium Range Training Device) and FMFS (Full Mission Flight Simulator) are the two types of simulation devices offered to the NH90 community in the framework of the Sogitec-NAHEMA business model and contract (see previous article). As complementary tools and sharing a large common technical platform, they gather the best of Sogitec's capabilities as an architect and provider of simulation training systems and sub-systems.

FMFS and MRTD: the best of Sogitec's technology

"Maximum communality" and "no sacrifice on the answer to training needs": this is how Program Manager Stéphane Mijonnet summarizes the pragmatic yet ambitious philosophy governing the NH90 program.

FMFS and MRTD have a significant part of equipment in common, making them close devices. Visual systems are comparable and based on Sogitec's latest image generation system Apogée™7.

Database generation is fully automated and sole source enabling to generate full theaters of operations with higher tactical and geographical realism and no corrections. To do so, Sogitec uses or provides its clients with Sindbad™ database generation system (and associated training). In addition, selected spherical screens guarantee very high definition image, especially thanks to chin windows which increase the field of view beyond the theoretical diagram of visibility and allowing for difficult hoisting operations.

Cockpit space increased to a 'third man'

Within the cockpit *per se*, uncompromising fidelity for both MRTDs and FMFS is present too. The entire dashboard is identical to the original NH90's and the cockpit space is increased to a 'third man', unlike already in-service devices within foreign Forces. Hence a full crew made of a pilot, a co-pilot (or a tactical coordinator, TACCO, for Navy purposes) and a third man. Motion cueing is also taken into account for MRTD and FMFS training realism. Dynamic motion



The functionalities of simulators, linked to Sogitec's Apogée™ image generator wealth of databases, fully replenish the operational characteristics of pilot training as well as of tactical missions.

... seats that equip French Navy and Finnish Army MRTDs (it is an option for French Army devices) is a much welcome innovation and make them closer to FMFS, which implements a 6-degree motion base and a 3-base motion platform.

Nearly unlimited capabilities for virtual training

FMFS as well as MRTDs are supposed to cover training curricula for all NH90 users that are as wide as possible, from initial handling of the helicopter to complex tactical exercises.

Like most simulators, both media allow for trainees to learn how to pilot an NH90 (initial training and conversion-to-type) and flight and navigation procedures: instrument flight, all-weather night and day operations, landing/deck landing on all sorts of drop zones. It is the wide range of possibilities in terms of tactical training, though, that places these sims, especially the MRTD, at the highest level of training quality. Navy and Army sims allow without exception for training for missions such as SAR (Search & Rescue), CSAR (Combat, Search & Rescue), oil rig, ASW (Anti-Surface Warfare), ASUW (Anti-Submarine Warfare), and all sea or land exercises in general.

The virtual environment found on Sogitec's NH90 sims is identical as well: Navy personnel benefit from dense databases and many land objects while Army per-

sonnel can train for deck landing on a warship sailing on 3D oceans.

Sogitec, acting as simulation architect, integrate all functionalities (sensors, environment, missions) that can be found or experienced inside the 'real' helicopter, including the HSMD-type fully-simulated TopOwl helmet.

Finally, the French Navy benefits from two additional complementary RCT (Rear Crew Trainers) systems. They can be used as stand-alone devices or networked with MRTDs (see below the 'pedagogical' aspects) and offer sensor operators a dedicated training capability.

The everlasting need for pedagogy and training tools tackling this issue

"Hyper collaborative" is the expression used by Program Manager Stéphane Mijonnet to define NH90 MRTD and FMFS training, as well as the attached pedagogical aspects of it. Instructor operated stations (IOS) give instructors a wide range of different 'pedagogical configurations'. For instance, the instructor can sit directly in the cockpit ('third man' using a 'remote IOS', actually a tablet PC). Up to three instructors can take part simultaneously in one single training exercise to operate the tactical environment as a whole. Navy exercises can get especially 'crowded' since —when a Rear Crew Trainer is added—up to eight people can be part an ongoing exercise simultaneously.

Networking of simulators in a close future

Finally, training centers are equipped with briefing/debriefing stations allowing for mission replays (under cockpit conditions) with a main instructor operated station replica. They are compatible with mission preparation systems and are HLA-enabled (High Level Architecture) via a dedicated gateway. This way, NH90 sims will be able to be networked with other simulators. The HLA networking capability should be demonstrated towards 2015 and is already of much interest for the Forces: NH90 Caïman-Tiger networking (French Army) and NH90 Caïman-Espadon NG Combat System sim networking (French Navy). ■

SIX SIMULATORS FOR FRENCH FORCES, ONE FOR FINLAND

End of May 2013, military bases to be equipped with NH90 FMFS/ MRTD are as follows:

- French Army Light Aviation Academy (*Ecole d'application de l'aviation légère de l'Armée de terre*, EAALAT), Joint Training Center (Centre de formation interarmées, CFIA), Le Luc: 1 FMFS, 1 MRTD;
- French Army Light Aviation base in Pau: 1 MRTD;
- French Army Light Aviation base in Phalsbourg: 1 MRTD;
- French Navy Naval Air Station Hyères: 1 MRTD, 1 RCT;
- French Navy Naval Air Station Lanvéoc-Poulmic: 1 MRTD, 1 RCT;
- Finnish Army base in Utti: 1 MRTD

'THE RIGHT NEED': SOGITEC'S MOTTO FOR THE MULTIYEAR IN-SERVICE SUPPORT (ISS) OF DELIVERED TRAINING TOOLS

Along with the contract for the delivery of one FMFS and five MRTDs for French Forces, a contract for the first tranche of ISS (10 years out of a total 20) was signed too. NAHEMA have delegated ISS contract management to the French Defense procurement agency (*Direction générale de l'armement*, DGA) first ('ready-for-training' year and the next), and to the French MoD Aircraft ISS agency (*Structure intégrée de maintien en condition opérationnelle des matériels aéronautiques de la Défense*, SIMMAD) next (starting two years after ready for training).

Finnish Forces, in the framework of the contract over an MRTD, benefit from similar conditions.

Provisions within the all-inclusive contract include, for all or some bases:

- on-site technical assistance;
- repairs;
- resupply of spares and consumables;
- delivery of spares (they remain Sogitec's property);
- obsolescence management;
- configuration management;
- recurrent training of personnel.

It is based on a strong requirement and principle associated with efficient spending for NH90 training tools. The requirement is a 95% operational availability calculated via all cumulated training effective time. The principle is having the customer paying "the right need", that is hours solely spent training on simulators indeed.

Technical assistance is done by Sogitec personnel at Le Luc Army base and Naval Air Station Hyères. Elsewhere, Armed Forces personnel maintain devices after having been trained by Sogitec which remains responsible for overall operational availability.

Obsolescence and configuration management are based on classic principles: anticipating, establishing, managing and sharing an in-factory industrial stock for all customer's facilities; analysis of helicopter evolutions, their applicability to sims and technical and financial proposals for configuration management.

OPERATIONAL POINTS OF VIEW

Lieutenant-Colonel Yves MANGIN (French Army Light Aviation), Head of NH90—Caïman training at Joint Training Center NH90 (CFIA, Centre de formation interarmées NH90)



“Simulation is a keystone, from initial to recurring tactical training for experienced crews.”

After serving in operational units during the first part of his career, he has held French Army Light Aviation (ALAT) training-related positions since 2003. He has served at the CFIA NH90 since its establishment in 2008. He is the head of training there. The center's mission is to train all Army and Navy crews and maintenance personnel. A training and NH90 expert as well as user of means of simulation, he has been part of the NH90 simulation requirements definition process since the beginning, the choice of the prime contractor, and he closely monitors the development of currently under-production devices at Sogitec.

In what context for the French Army Light Aviation does increasing operational work and training with the NH90 take place?

Given the ageing of the Puma maneuver and assault helicopter fleet, the entry into service of the Caïman—which answers modern conflicts' requirements (operational efficiency and crew protection)—is urgent. On-theater deployment of a first Caïman TTH unit is planned as early as 2014. Time is short, the pace is ambitious. Training has begun in April and the 1st Regiment of Combat Helicopters (*1er RHC*) will be delivered their first Caïman. The schedule is tight but held. We expect industry partners to hold schedule in the same way. Sogitec was selected in particular on the basis of this requirement and we are confident in the company's capacity to deliver on time.

What training objectives does the acquisition of simulation means from Sogitec answer?

Operating a modern helicopter like the NH90, managing combat and navigation systems has gained prominence over acquiring flight basics. Simulation is hence a keystone to be found during all phases, from initial to recurring tactical training for experienced crew. It allows for efficiency and realism along with cost and time savings for the operational use of helicopters. The Army then came up with its procurement project from Sogitec: extended range of adapted means (3 MRTDs/1 FMFS), accurate full helicopter simulation, school training and on-site training.

What is the distribution of allocated slots in FMFS/MRTD and real flight? And initial and tactical training?

After 15 years of lessons learned about the benefits of simulation for training and via a pragmatic session-after-session approach towards what can be done with

simulators, we have reached an above 70% rate for the use of simulation (practical crew training sessions using all means: Part Task Trainer (PTT), MRTD, FMFS). MRTD and FMFS amount for 42% of initial and 41% of operational training alone.

What is the range of operational missions crews are trained for using FMFS/MRTDs?

ALAT has chosen to procure realistic, faithful and comprehensive simulation that simulates all NH90 embedded combat systems. We have been very careful with the choice of the CGF to place crews in conditions as close to reality as possible for both low (or population rescue) and high intensity operations (stressful air combat) where tactical environment's role is essential. Realistic involvement cannot be reached in peacetime deploying real means. Only simulation allows it. In addition we have chosen 'proximity' simulation means, within combat units, that can be networked and work together and with other Army and Armed Forces means. This way, it will be possible to both technically and tactically train experienced crews for Caïman's full operational range.

What are your expectations towards Sogitec in terms of support and availability?

We expect a lot from Sogitec for MRTD/FMFS support and availability (95% of contract time of use). We have chosen the company for its serious credentials, its competencies and its services of quality, all demonstrated during the Rafale program for instance. Training, operational readiness and lives of our crews depend on that too. We thus ask Sogitec for the best, within a close partnership, a "brotherhood in arms". We place our full trust in Sogitec to succeed in the missions we have been tasked together.

Lieutenant-Commander Sébastien LAFON (French Navy), Deputy Commander for Operations, Flotilla 31F, Naval Air Station Hyères



“NH90 is a pioneers' trek. We explore domains previously unknown to helicopter specialists.”

A pilot for 21 years, he has served in operations and as an instructor for a significant number of aircraft (Rallye, Cap 10, Alouette 3, Dauphin, Panther, Lynx, NH90) and means of simulation (NH90 PTT, FNPT II Dauphin, FFS Lynx/Dauphin/NH90). Under his authority, an NH90 Instruction team develops and implements various Caïman Marine training modules. A Simulation Programs team deals with developing and validating simulation tools.

In what context for the French Navy does increasing operational work and training with the NH90 take place?

Work using the NH90 increases at a steady pace: delivery of the first aircraft in May 2010, partial operational entry into service and maritime security actions operations started in December 2011, first anti-surface and anti-submarine warfare operational capabilities in November 2012 and February 2013. First long-time mission on a Aquitaine-type frigate between February and May 2013. We have to confirm these initial capabilities, integrate and increasing number of new crews and maintain older personnel's know-how with a finite number of training hours. A real challenge!

What training objectives does the acquisition of simulation means from Sogitec answer?

The requirements are for a motionless MRTD-RCT N1, with dynamic motion seat, flight simulator for initial and recurrent crew training in the cockpit (MRTD) and the cabin (RCT) for all land, sea, day, night, all-weather use of the Caïman Marine. The two modules are networked together for more training relevance. Some actions of the cabin crew member remain outside the scope of simulation and are practiced while flying: gun-port shooting, hoisting, load transport... The goal is to train crews in a monitored tactical environment, in particular in terms of participating units. Simulation is the cheapest solution for realistic tactical air-sea combat exercises without helicopter availability, participating units and weather constraints.

What is the distribution of allocated slots in MRTDs and real flight? And initial and tactical training?

For initial training, the first estimate is 15% with a PTT and 35% with the MRTD minimum. Tactical training

should be simulation-based for 20% of yearly flying activity. This distribution was decided before knowing actual MRTD-RCT N1 simulation capabilities. If simulation is at the expected level, its part will be increased for more flight hours for operations. NH90 is a pioneers' trek. We explore domains previously unknown to helicopter specialists: publications in English, single-pilot crews augmented with a tactical and a sensor coordinators, last generation multi-mission helicopter, innovating realistic simulation benefiting, for instance, from dynamic motion seats. Training programs will take this into account and be innovative.

What is the range of operational missions crews are trained for using MRTDs?

The MRTD-RCT N1 allows for most missions assigned to crews in daytime, night and NVG conditions: 1/ support/safeguarding (faults and failures, navigation, landing in small zones, instrument flight, formation flight, stationary flight, deck landing, search and sea surveillance); 2/ anti-surface warfare (RADAR, FLIR, L11, radio-communications, electronic warfare, flares); 3/ anti-submarine warfare (sonar, buoys, torpedos); 4/ maritime counter-terrorism (sea assault conduct and support, dropping sea commandos, sea pursuit...).

What are your expectations towards Sogitec in terms of support and availability?

We look for a relationship based on trust for fruitful discussions when establishing future orientations. Sogitec must help us through the first few months of operating the simulators in order to improve discrepancies between sims and the real helicopter and tactical environment. We obviously expect high availability in order to meet a 9-to-14-hour-per-day minimum use requirement, as well as reduced operating costs.



FULL EFFICIENCY FOR 'SUPPLEMENTAL'

TECHPUBS PROCESSES THANKS TO 'BOOSTERS'

When Sogitec Industries, Dassault Aviation and Dassault Falcon Jet get together to improve support processes' efficiency, results they get for 'supplemental' technical publications—now benefitting from Sogitec's latest innovations—are convincing.

'Supplemental' is a term often found in the business aviation lexicon. It refers to the phase of customization of the aircraft, led in close partnership with the customer, starting with writing specifications attached to the initial contract all the way to the aircraft delivery, along with support technical publications.

The PLM and automation context

As other industrial processes within Dassault Aviation, the 'supplemental' process is linked to the manufacturer's will to extend Product Lifecycle Management (PLM) to all processes and streamline overall design, manufacturing and support processes. The goal is to significantly improve efficiency and, as a result, products and services.

In this context, the version 5 of the PLM ('PLM v5') has been implemented along with automated boosters at the engineering and manufacturing levels in accordance with the 'eSpec' process, preceding 'supplemental', to which Sogitec has contributed since 2001.

The same requirements for full efficiency have spread to Sogitec and Dassault Falcon Jet, both companies sharing technical publications authoring tasks. Publishing tasks are made via a common documentary DocTec system, hosted and administered by Sogitec.

Why use automated boosters?

Automated boosters are algorithms compiling input data to generate output data. This depends on how detailed and structured input data actually is. And careful!

Authors are always part of the process as they are required to validate final results. Automats are nothing absolutely new at Dassault Falcon as wiring manuals have been automated since 2002. But this time, spares selection, the supplemented illustrated parts catalog (SIPC) and the supplemental maintenance manual (SMM) are clearly targeted.

For historical reasons, a heterogeneous information system was used. A preliminary step consisted in making sure PLM v5 and DocTec are the two sole tools used to design, write and publish supplemental Falcon technical publications. What had been achieved for 'basic' technical publications (see *InterActions* #24: 'Falcon: The Great Migration') has been achieved for 'supplemental' technical publications as well.



The design project as the customer may visualize it in 3D on the digital mock-up.



The supplemented final project documentation will be automatically integrated to the original technical support documentation.



A complete documentation automatically generated from the new interior design

The digital mock-up allows the customer to visualize his choices for the interior design. Automated boosters of the 'supplemental' processus will then generate a complete documentation covering assembly, materials, spares, maintenance and servicing procedures, etc., specific to the selected design. This documentation will merge with the aircraft original technical support documentation.

❖ SMM automation

Reuse of only parts of technical publications relied on authors' sole memories, generally in the way of duplicating data, because it was not structured enough indeed to be used in an automated fashion. This difficulty was solved with the creation of a single documentary fund, the World Wide Work Package (3WP) within which Sogitec and Dassault Falcon Jet put documentary authoring units in common. Creating and maintaining the 3WP requires coordination from authors that are separated not only by an ocean, but also by different cultures. This coordination was deemed indispensable when the program started and has been going on since.

Only after tools and methodology were established by Sogitec and adopted by Dassault Falcon Jet, integrated French-American teams were built with a workshare by chapter and crossed validation. Sogitec, via the Business Unit Falcon (BUF), has also been asked to contribute to make sure 'supplemental' technical publications are consistent with 'basic' technical publications, thus acting as a true integrator. This 'double coordination' (tools/methods, technical publications) is the key of this phase of the project. The next challenge was to make sure 3WP was to be easily reused in a just-in-time context as at least one set of supplemental technical publications is delivered

every week. Given this production rate, a booster was offered, used and delivered by Sogitec to Dassault Falcon Jet. It uses the previously created (3WP creation) link between technical publications and design data, the latter carefully chosen because they are stable over time: the 'automation rule'. Thanks to this 'rule', the booster takes in charge new customization's design in order to create largely pre-written technical publications with, as noted by Product Manager Laurent Germe, "*blanks to fill in and the possibility, if needed, to create additional automation rules*".

Booster for spares selection and the SIPC

Two boosters have been created: the first one, named 'Spares Selection', sets the list of procurable parts, while the second one creates the illustrated parts catalog (IPC).

These boosters use the digital mock-up (DMU), in particular the bill of materials (BOM) of the new customization, but also data saved within DocTec, whether for French or American aircraft.

Results are shown within the DMU for the user to identify as quickly as possible what is left to do. Spares selection is then completed without typing: any 3D part can be selected and its status changed (spare, non-spare).

The 'spare selection' booster is a case in point as it not only interfaces "spares" and

'IPC' teams in a more efficient way (less mistakes, less time, better quality), but it also allows for a more efficient use of PLM data (30 to 50% time and money saved). The SIPC booster is similar: it uses similar data (spares selection, DMU, and SIPC history stored in DocTec) and allows for quick search and identification of existing IPC lists and graphics. 3D is used too to quickly visualize the IPC print on the product, identify leftover tasks and complete technical publications almost without typing.

Consistency with spares data is increased and typing and creating lists are made significantly shorter. Current implementation at Sogitec, and then DFJ, premises has delivered results that meet initial objectives.

The future: 'more automation' rather than 'full automation'

Even if comprehensive lessons learned from the use of boosters are still to be got, two future directions can be set.

First, automation is not an end *per se*. Hence the need for a thorough and fine analysis of existing processes—including PLM evolutions to come—when starting any program in order to qualify and quantify expected gains as well as needed investments.

Second, the main risk to tackle is the impossibility, for a machine, to deliver an error-free output if input data is not error-

free. Processes and tools before and after the ones implementing boosters must be improved too.

Automation is a long-run process leading specialists to favor a step-by-step approach rather than a more 'brutal' one despite greater relevance demonstrated by Sogitec, Dassault Aviation and Dassault Falcon Jet. ■

NEW AGE DOCUMENTATION eTouch COMPANION™

Offering unrivalled high mobility, the new software suite aims at becoming an indispensable tool for combat pilots and both civil and military maintenance technicians.

"Intuitiveness, efficiency, mobility" is, according to product manager Pierre-Georges Muller, the three-pronged approach that summarizes best Sogitec Industries' new product concept: eTouch Companion™, a software suite which, based on already existing products (FIELD 5, FalconSphere®...), pushes the boundaries further.

An intuitive, efficient and mobile tool

At the origin of eTouch Companion™, we find significant joint work with Dassault Aviation based on lessons learned from using Rafale technical publications. Surveys aiming at pilots have proved Sogitec Industries that the increased use of new information technologies was the best way to keep innovating in order to better respond Rafale pilots' operational needs.

It has become obvious indeed that the quality gap could be bridged mobility-wise with transportable hardware. This hardware has to be secure, linked to information systems, can be used in and around the aircraft, hosts user-oriented interconnected applications, and emphasizes contents rather than functions.

Addressing the quick handling issue

First, like what prevails at the consumer market level, the quick handling issue had to be addressed in order to replace formal prior training with what 'people already know how to do', i.e. interacting with a touchscreen. This is intuitiveness, which requires ranking priorities and addressing users' needs in a modular fashion.

Second, under all operational circumstances, any pilot's time is few and precious. Hence, accessing relevant data must be as fast as possible. Resulting from the need for speed and relevance is efficiency.

Third, because movement is a 'pillar' of aeronautics in general, constantly having your desktop by your side is mandatory. This is mobility.

A tool for operational personnel

From now on, the 'Pilot Companion' element of eTouch Companion™ is developed for Rafale pilots. Pilot Companion aims at an operational use before or after flying *per se*, via Dassault Aviation and Sogitec Industries-provided applications (flight manuals, etc.) and user-managed add-ons (personal files, third applications). Pilots already praise the ease-of-use and the overall richness they get from this.

A version for maintenance personnel

The 'Maintenance Companion' element for maintenance personnel allows a specific answer targeting maintenance tasks (specific DTD's, wiring, IPC...) while benefitting from above-mentioned advances for pilots. This version is set to answer military and civil own specific requirements (ATA, S1000D,...). Maintenance specialists testing the product definitely see it as a tool that can help them in their daily work.

If eTouch Companion™ is definitely not aimed at being used while flying, it offers unrivalled mobility and will satisfy those who want to carry around with them all the best customer service applications developed by Dassault Aviation and Sogitec Industries. Interaction between aircraft manufacturers and their customers could undergo drastic changes through this hardware which will not only fuel lessons learned, but will also accelerate the introduction of new services. All of this without having to adjust the applications already in service. ■

eTouch Companion™ brings together Sogitec Industries' experience and the best available technologies

eTouch Companion™ is an innovative product that cashes in on work that has been done on Rafale's technical publications for more than a decade (structuring based on S1000D specifications, aerospace semantics, immediate techpub selection depending on selected aircraft configuration...).

■ It also benefits from Sogitec Industries experience in the fields of **viewers and digital data processing** which eventually brings and connects together various applications in single piece of hardware efficiently.

3D is obviously part of eTouch Companion™ with the VorTec™ engine derived from Sogitec internationally known experience in image generation.

■ Another asset of Pilot Companion is **update management**. Applications are securely updated via the newly developed "Distribution Booster" tool. All of this is done without extra handling from the user who can access and upload the latest information and applications via the network, a USB-key, etc.

■ **Touchscreen** compatibility, directly derived from ViewTec™ viewer's v3 version, is improved for an enhanced user's experience using the latest available technologies.



eTouch Companion™ is primarily aimed at being installed on tablets but can be used on all PC hardware that is Windows 8 operating system-equipped in order to match specific aerospace and information system requirements.





in d e

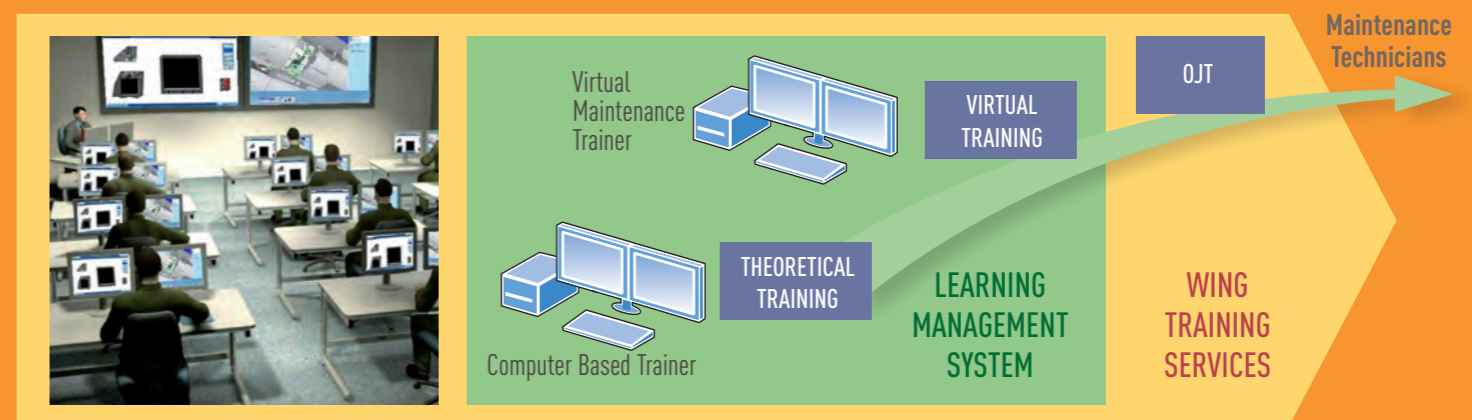
MAINTENANCE TRAINING FOR MIRAGE 2000 I/TI

In July 2011, the Republic of India's Ministry of Defense awarded Dassault Aviation and Thales a contract for the renovation of the Indian Air Force (IAF) 51-aircraft fleet of Mirage 2000. Having been a partner in the Mirage 2000H/TH (now known as Mirage 2000I/TI) since the 1980's, Sogitec Industries carries on with the development of a modern and powerful maintenance training tool: the Weapon System Maintenance Trainer (WSMT).

Establishing, testing and adapting any training curriculum for maintenance personnel is no easy task for today's air forces. Current debates are fueled by various issues such as replacing ageing personnel, dealing with limited availability of in-service materiel for training purposes, and the necessity to update pedagogical contents and tools more frequently. Training facilities for maintenance personnel have to solve a complex equation based on the following:

- 1/ the need for maintenance specialists and inexperienced trainees to train together using the same tools;
- 2/ guaranteeing that all benefit from both theoretical and practical training of quality;
- 3/ not reducing materiel's operational availability and readiness because of practical training;
- 4/ to be able to train for all aircraft maintenance operations, including the most rarely performed.

On the basis of its three-decade-long



experience, Sogitec has tackled these issues to solve that equation.

'All-in-one' tools

Maintenance training is nothing new within the IAF. The training devices delivered by Sogitec in the 1980's have performed very well for the past thirty years. Based on real or simulated aircraft components and subsystems, those devices are still in service as part of the Mirage 2000H/TH training curriculum. Sogitec's goal has always been to deliver tools 'all-in-one': for all personnel ("newbies" and experienced); for all training (theoretical and practical, basic and recurrent); for all operational contexts (real aircraft and systems available or not); and replicating as many scenarios as can (tasks, faults and failures, including seldom encountered ones).

Within the IAF Mirage 2000 upgrade program, the rationale for maintenance training and the associated tools to be delivered is similar. This is why the IAF

ordered the WSMT for the new Mirage 2000I/TI weapon system. It is to be implemented on PC desktop stations installed in classrooms in order to meet O-level weapon system maintenance training needs.

A full set of training exercises

Trainees learn Mirage 2000I/TI weapon system maintenance and troubleshooting procedures using the WSMT as follows:

- immersion in a comprehensive virtual environment (ground-based operations, systems operational checking, fault and failure diagnosis and repair, maintenance procedures, and using tools and testing equipment);
- the trainee can proceed with diagnosing and virtually locating the LRU, and replacing it using maintenance means and data available as in real life;
- the operational use of additional maintenance and its associated means (technical publications, ground support equipment) by the trainee to isolate a failure, diagnose, validate a repair, solve ambigu-

ties, and validate weapon and navigation circuits.

Hence maintenance personnel are provided with a comprehensive set of exercises based on various maintenance scenarios. This set is used within the framework of a Learning Management System (LMS) allowing for managing scenarios' progression. ■

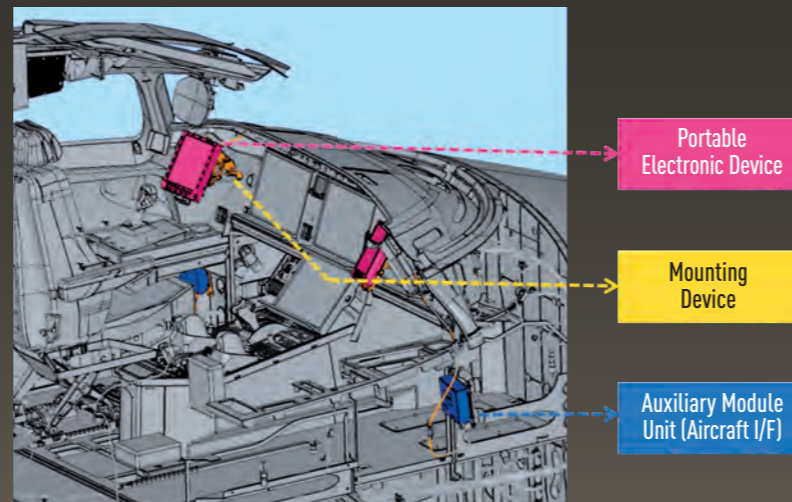


EFB

★ A POWERFUL DISPLAY TOOL FOR FALCON PILOTS

* Electronic Flight Bag

Connecting aircraft, pilots, operations offices, manufacturers and service providers via a simple secure ground/air infrastructure is one major goal for the industry. The Falcon EFB has created this link and services were left to be developed. At the edge of innovation and services for business aviation, Sogitec Industries and Dassault Aviation got together to tackle this challenge. And the goal is reached with the release of the Falcon Sphere® software suite, the beginning of a new adventure.



More than a mere tablet, Electronic Flight Bag (EFB) refers to a rather useful tool for pilots: flexible, to be used during all ground and flight operations, fully connected with avionics as well as with ground systems. With FalconSphere®, the EFB now benefits from ground solutions and a software fully usable while flying. But first: what is an EFB for?

A technical strategy aiming at paperless cockpits and connected aircraft

First and foremost, the EFB is for pilots, available during all phases and places of the 'mission': inside/outside the cockpit, during flight preparation, during the flight, while debriefing... It allows pilots to benefit—without having to manage it—from a large amount of easy-to-access information, including in case of emergency.

Dassault Aviation has chosen class 2 EFB (see figure below), offered as an option to all Falcon customers starting in 2007. This offer has been very successful with significant equipment rate.

EFB mobile hardware is provided by Canadian company CMC and is a ruggedized PC:

- that is DO160 certified (see figure below);
- whose touchscreen can operate under extreme conditions;
- mounted on a pivoting arm specifically adapted to each Falcon model.

It is connected to the aircraft and ground stations via dedicated hardware (Auxiliary Module Unit, AMU) and its associated wiring (28V, Ethernet, ARINC-429, RS-422...).

Motivated by a technical strategy aiming at paperless cockpits and connected aircraft, Dassault Aviation's wish has been to provide EFBs with a consistent and efficient software suite to obviously improve overall customer service value: fuel savings, mass reduction, rationalizing processes. These technical strategy and objectives are FalconSphere®'s true DNA.

WHAT IS AN EFB?

An EFB is an electronic display device providing flight personnel with functionalities usually delivered by printed supports (maps, manuals, performance measure). It is either:

- **Class 1** – laptop or tablet that is not connected to the aircraft
- **Class 2** – mobile DO-160 aircraft-connected piece of hardware
- **Class 3** – screen that is part of the avionics

EFB Falcon: what are its capabilities with FalconSphere®?

FalconSphere® is primarily a modular solution, including applications that are all needed to prepare and perform a mission.

These applications must run all together whether during ground or flight operations. To this end, Sogitec Industries and Dassault Aviation have jointly developed a host structure (see figure p. 20) that launches applications, switches from one to another easily, and, when needed, transport data while transitioning from one app to the other (for instance, a take-off card calculated by the operations bureau using 'Falcon Perf' can then be sent to the pilot via 'Link to Ops' and finally stored in 'Flight Folder' for later use). EFB administration has not been neglected. Closely monitoring EFB contents (software and data) is a basic requirement, hence updating via secure Internet link relying on the already experienced ground FIELD 5 network servicing thousands of customers.

This hosting structure is all the more the ideal complement to professional applications, so as it already hosts additional applications, including those directly chosen by operators.

The ergonomics challenge

Regulations are very strict: an EFB must be ready-to-use and no other intervention (such as downloading an application e.g.) from the pilot, apart from switching it off and the actual operational use, is allowed. Once the device is on, pilots' workload must be optimized.

To meet this requirement, Dassault Aviation and Sogitec have come up with an original man-machine interface bringing together the best EASy avionics and the consumer market! Colors are assigned a specific meaning, shapes have been discussed extensively, every icon have been carefully designed, the rendering of each page has been optimized and validated and overall behavior has been homogenized. All of this makes FalconSphere® an efficient and intuitive tool.

All-electronic flight techpubs...

Objectives for flight technical publications have been as ambitious. Again, with a view to simplifying pilots' workload, techpubs have been reformatted specifically for EFB: it can be displayed in white or black font, it fits EFB screen's dimensions perfectly although it has not been authored and published to this end, and it has an enriched electronic index and links facilitating non-linear access to relevant information.

APPLICATION	OVERVIEW	PROVIDER
Falcon Manuals	Falcon Manuals turns paper-based techpubs into electronic techpubs with a filtering function (S/N). The viewer was optimized regarding Dassault Falcon cockpit and EFB characteristics. Finally, browsing capabilities have been added allowing browsing from one manual to the other (following a CAS, procedure or equipment) or within a manual (following notes and indexes).	SOGITEC
Flight Folder	A document folder managed by pilots within which documents and results from calculations are stored.	SOGITEC
Falcon PERF & EPM	These applications calculate aircraft performance during takeoff, landing and cruising. They are used before flying and possibly, in case of emergency, during the flight.	DASSAULT
Link To Ops	A mail service favoring communication between pilots and operations bureaux.	SOGITEC
Ops Docs	An 'operator' document directory managed by an administrator, to be used by pilots.	SOGITEC
FliteDeck XMWeather	Dassault-selected applications to access maps and weather data.	JEPPERSEN & HONEYWELL

... ❖ ...Filtered for each jet

Each aircraft has its own specific technical configuration (aircraft modifications, service bulletins, options,...). In addition, they are operated under various conditions (e.g. the country of registration—whether it is Russia, China, Europe, or the United States—goes with specific regulations). Flight techpubs being very precise, it is no surprise it contains data not being applicable to all aircraft and contexts of use.

On the other hand, given that checking whether data is applicable or not is outside the pilot's scope, techpubs must be customized before being operated. To this end, every operator manually updates paper technical publications selecting relevant applicable data from overall data published by the aircraft manufacturer. With FalconSphere®, this task has become largely automated since user's interaction has been reduced as much as possible. The user still must define the aircraft and the context of use and then validate software-generated results, but it is no longer necessary to look up to pages/sections, headers, and summary tables, to interpret applicability marks or classify updates. A true innovation!

A fruitful Dassault Aviation-Sogitec Industries collaboration

The Falcon EFB results from a closely integrated Dassault Aviation-Sogitec team involving all specialists from the parent company and its subsidiary to develop the system. Let us not forget Dassault Falcon Jet, especially involved in the

sales process. It is an extended pool of experts that have learned to work together to tackle challenges bringing in their respective knowledge.

In this context, Sogitec's mission was crystal clear: provide Dassault Aviation with a consistent software suite for the EFB device.

While Dassault Aviation acts as prime contractor and, for practical reasons, remains in charge of performance applications (Falcon Perf, EPM), choosing Sogitec as its partner is natural given existing synergies between EFB applications and other main ongoing documentary projects (FIELD 5, Companions, Maintenance Manuals...).

What's next?

Users' feedback has been positive after having delivered versions alpha and beta. Then, the complete suite has been validated, delivered and integrated and sales process has begun.

Although a significant step, the launch on the market does not mean everything is over as further developments to come are numerous:

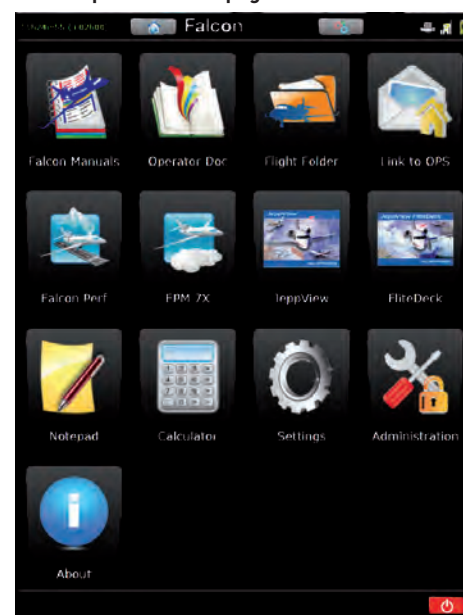
- helping customers who wish to do so to be 'paperless certified' by aviation authorities in accordance with regulations is objective number 1;
- offering new applications and services: mass and centering, aircraft video streaming, flight debriefing, dispatch assistance, electronic check lists, logbooks, and maintenance-related applications;
- offering hardware upgrades every 3 to 5 years given the pace of change in the

consumer market.

In order to succeed straight away, new applications must stick to three rules:

- bringing about gains that can be demonstrated (safety or fuel consumption e.g.);
 - fitting well in the host structure, hence benefitting from existing infrastructure and technologies;
 - making the best from Class 2 EFB's peculiarities: the only piece of equipment that is avionics- and Internet-connected.
- Many challenges indeed that can only, if tackled well, increase the EFB and FalconSphere® added value in the end. ■

FalconSphere® home page.



FIFTIETH PARIS AIR SHOW: THE PLACE-TO-BE!



50TH INTERNATIONAL
PARIS AIR SHOW
LE BOURGET
FROM 17 TO 23 JUNE 2013
WHERE AEROSPACE LEADERS
GET DOWN TO BUSINESS

SOGITEC, A LONG-TIME AND FAITHFUL EXHIBITOR

Sogitec has declared total mobilization to present its latest innovations at Aerospace and Defense industry's main corporate communication event: the fiftieth edition of the Paris Air Show.

On a 160 sq. m booth, Sogitec presents again a previously successful real-time full visual system which—besides Octopix® (see InterActions n°25) and an increasingly detailed database—introduces Apogée™ 7, the latest, more powerful, version of the Apogée™ image generation system series, equipping NH90 simulators (see p. 2-9). The emphasis is also put on maintenance personnel training with solutions for Rafale (Rafale Learning Suite), Mirage 2000 (see p. 16-17) fighters and Tiger helicopter.

Technical publications engineering is not left out with the new 'boosters', allowing for more efficient use of engineering data for techpubs authoring and publishing. Innovating hardware and solutions for consultation such as FIELD5 and, especially, eTouch Companion (see p. 14-15) complete this dense pool of demonstrations. ■

To visit us: Hall 2B, stand F171
Contact: contact@sogitec.fr



APPOINTMENT A NEW CEO FOR SOGITEC INDUSTRIES

On May 17, 2013, the Board of Shareholders appointed André Piaton as Sogitec Industries' Chief Executive Officer.

A Supélec engineering school alumnus and CHEAR former auditor, André Piaton previously held, for thirty years, various technical as well as managing positions at Dassault Aviation.

After having held several jobs, first at Brétigny flight testing facility and then within the Engineering Directorate (*Direction générale technique*) in Saint-Cloud, André Piaton was appointed Deputy Vice-President Engineering of Dassault Falcon Jet in Little Rock (United States) in 2007. During his busy time there, he worked with Sogitec to establish a single automated process to generate 'supplemental' technical publications using DocTec.

Back in France, he joined the International Sales Directorate (*Direction générale internationale*) where, under the authority of now Dassault Aviation's CEO Éric Trappier, he was in charge of managing military export contracts until his recent appointment. ■

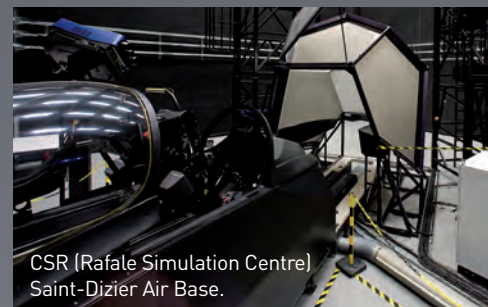
SOGITEC INDUSTRIES AWARDED AXED* CONTRACT BY FRENCH DEFENSE PROCUREMENT AGENCY (DGA)

* *Analyse et expérimentations technico-opérationnelles pour l'Entraînement Distribué sur simulateurs pour les opérations militaires aériennes.*

For the benefit of the French Air Force (AAF), Sogitec Industries (main prime) along with Cassidian (CASPOA aspects) got awarded a contract by the French Defense Procurement Agency (DGA) for the Distributed Mission Operations (DMO) technical operational study AXED.

Two-year-long AXED aims at assessing benefits and limits of possible training solutions through the networking of AAF simulators. The objective of such a DMO capability is to improve operational readiness allowing richer and more demanding training than what can be achieved by instructors in training centers.

DMO operational, organizational, technical and program issues are analyzed and the results are illustrated by three demonstrators involving four AAF training centers: SimFAC (Nancy, Forward Air Control), Rafale Simulation Center (CSR, Saint-Dizier AFB), SimSDCA (Avord, Air Defense) and ICC/ITC CASPOA (Lyon – Mont-Verdun, C2).



CSR (Rafale Simulation Centre)
Saint-Dizier Air Base.

The expected outcome of the study are recommendations for the operational deployment of DMO, especially proposals for technical solutions likely to solve constraints regarding information systems security.

At the end of 2013, demonstrator 1, featuring SimFAC and CSR networking, will illustrate training capabilities for Close Air Support (CAS). The two subsequent demonstrators, planned for 2014, will demonstrate DMO's potential for Air/Air Missions and for the C2 chain (from FAC to CAOC) training. ■