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EUROPEAN COOPERATION IN THE TACTICAL TRANSPORT HELICOPTER

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Curriculum Vitae of Col. VALENTE

- Col. Emidio Valente is an Officer of the Italian Army who started his career during World War II as a tank officer.
- After the war he became an observer with the Airforce and subsequently pilot-observer in Army Aviation.
- As fixed-wing pilot he has accumulated great experience as flight instructor and Chief of Flight Standardization.
- In 1962/63 he attended a helicopter course in the United States, at the Army Aviation Center of Fort Rucker, Alabama.
- Upon his return to Italy he reorganized the helicopter flight training at the Army Light Aviation Center and subsequently he was called to the A.L.E. Inspectorate as Head of the Materiel and Experience Section.
- He was then Head of the Army Light Aviation Section in the Research and Studies Office of the Army General Staff.
- Presently he is coordinator-officer of the development programme for the A-129 light anti-tank helicopter and responsible for european cooperation in the helicopter field in the Army General Staff.
- In 1979 Col. Valente addressed a speech on airmobility requirement of the Italian Army at the Fifth European Rotorcraft and Powered Lift Aircraft Forum in Amsterdam.

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SUMMARY

- Why the cooperation? The European Cooperation, viewed as common policy at Government and Industry level is essential in meeting the high costs incurred in the development of any new aircraft, by broadening the distribution of costs on a larger production scale.

- Benefits and Difficulties: the obvious economic, engineering and operational benefits that a cooperation from a commercial and military viewpoint would imply, may however be counterbalanced by the possible insurgence of initial problems due to harmonization and tuning of requirements, sharing of responsabilities and general organization of the cooperation.

- Prerequisites for the Cooperation:
  . accords at Government and Industry level,
  . high volumes requirement within a limited period of time,
  . harmonized operational requirements,
  . requirement for new vehicles, rather remote in time.

- Endeavors and Achievements of the Past

- Existing Base for a European Cooperation in the Helicopter Sector:

  . Understanding at Government Level; The Helicopter Quadripartite; The Declaration of Principles.

  . Industrial Agreement: MOU signed by AEROSPATIALE, AGUSTA, MBB, WESTLAND.

  . Mutual Conceptual Support: FINABEL.

- The Tactical Transport Helicopter:

  . Verification of the conditions for a European Program.

  . Class of the future aircraft.

  . Current situation and auspicated progress.

  . Additional roles for the Tactical Transport Helicopter, outside the Army.

  . The operational requirements of the Italian Army.

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I. INTRODUCTION

Last year I had the honour of delivering a speech to such a qualified audience as the one attending this Forum. On that occasion I outlined the Italian Army's operational concepts in relation to helicopters which were intended as guidelines for the development of future aircraft, with particular regard to the light antitank helicopter, a forthcoming programme which is running smoothly.

Turning to the future trends in the nineties a hint was made as to the need to have the current multirole AB 204 and AB 205 helicopters replaced by a real tactical transport helicopter. Having regard to the fact that the latter aircraft can be used by many countries and a number of sound conceptual and industrial premises are in favour of its coming into being as an international collaborative effort, I thought it advisable to pick up this issue again both to highlight the aspects connected with the hoped-for European collaboration and to describe the operational concepts of the Italian Army as far as the tactical transport helicopter is concerned.
Once these concepts are tuned to those of the other European allies, they could originate a common operational requirement, one of the essential conditions for any further step.

Therefore, two are the issues I am going to examine:

- European cooperation in the helicopter field, namely:
  - . Why cooperation?
  - . Advantages and difficulties
  - . Prerequisites
  - . Past attempts and achievements
  - . Fundamental principles on which the cooperation rests
- Tactical transport helicopter, in particular:
  - . Review of the conditions essential to the implementation of a European programme
  - . Class to which the future aircraft is likely to belong
  - . Current status and expected progress
  - . Other operational tasks the tactical transport helicopter may perform beyond those required by the Army
  - . Operational requirements of the Italian Army

II. EUROPEAN COOPERATION IN THE HELICOPTER FIELD

1. Why cooperation?

In my opinion, one can hardly object the need for the rotary-wing field to be viewed in a perspective of European cooperation, such as is the case of other fields.
However, the time concept of "cooperation" should be correctly understood, as it cannot and should not be meant as an integration of the European helicopter industries into a sort of European monopoly which, in the long run, would not benefit both the users and the industries concerned should the drive of a sound technical and commercial competition fail.

The correct meaning of the concept of "cooperation" should be instead understood as a series of agreements among the various Governments and industries to pursue a common policy to avoid the overlapping of efforts, useless competition, the lack of standardization in the production of major military hardware and to foster, at the same time, the mutual technological progress.

Commercial and, even to a greater extent, military helicopters are highly expensive vehicles as a result of the impact on the cost of the basic aircraft of the special features required by users which enable the helicopter to operate and survive on the battlefield.

An appropriate development and industrial cost-sharing, which would keep unit costs within acceptable limits, is solely dependent upon wide production outlooks.

Although the military and commercial helicopter market is still going strong, the overall requirements for a given aircraft could hardly reach in each country such a level as to permit production at costs compatible with the available financial resources.

Obviously, this applies to military programmes for, even assuming an upsurge of commercial operations, the military requirements only can provide a proper production basis, at least as far as helicopters of a given class are concerned.

On the other hand, in view of a keen European competition (let alone the competition from overseas), if anyone were free to act independently, neither the export factor would make the difference.

2. Advantages and difficulties

Thus, the advantages deriving from cooperation may be summarized as follows:

- from the military viewpoint, programme cost reduction, materiel standardization and interoperability, better and more advanced product
- from the industrial viewpoint, rationalization of the exploitation of available resources, fair work-sharing, common exploitation of the partners' know-how, coordinated effort on overseas markets and better chances over overseas competition.

On the other hand, the cooperation might cause some problems, expecially in the industrial sector, mainly because a cooperative effort may entail the necessity for some partner to give up any immediate privileges or advantages, waiving any right for fully free action in view of more substantial long-term assets.

As far as the military aspect is concerned, the main problem arises instead from the adjustment of the various operational requirements and from the need to set the single domestic programmes in a correct temporal perspective.

Further difficulties may also arise from the general organization of the cooperative effort, the attempt to achieve a fair and balanced sharing of costs and responsibilities, etc. The greater the number of partners taking part to the programme, the more arduous the problems involved.

In my opinion, however, it should be stressed that all these, rather than prejudicial conditions, may be viewed as initial problems which can and must be mutually solved with a view to contributing to the common defence of the European interests.

3. Prerequisite for the cooperation

As previously pointed out, the European cooperation in the helicopter field must rest on Government and industrial arrangements.

As far as intents go, the cooperation can be promoted by Government and industrial understandings aimed at rationalizing efforts in such a critical area as the helicopter field.

However, no sound programme can be started without any real common operational requirement for a given aircraft capable of meeting various and sometimes contrasting requirements.

Unlike fighter aircraft which are designed to meet a specific role, the helicopter (except special helicopters which are designed to perform roles similar to those performed by fighter aircraft) is in itself a flexible and multi-purpose vehicle having its strong points in these two features.

However, flexibility and multirole characteristics are forcibly subject to some limitations which must lead to compromise solutions when different requirements are to be met such as those set for instance by the Army and the Navy.

Consequently, if on the one hand the requirement in terms of quantity must be such as to reasonably justify the cooperation, it is also necessary that the aircraft which would come out of the cooperative effort be capable of performing the different roles required of it by the Armed Forces and be attractive as well to non-military operators. Unless of course the aircraft involved is highly specialized as, for example, an attack helicopter.

This implies one of the difficulties hinted above, namely the harmonization of the national operational requirements, which in turn are the outcome of the harmonization of the individual Armed Forces operational requirements within each Country. In conclusion, the conditions required to launch a development program for a new helicopter are:

- the existence of accords at Government and industry level;
- high volume requirements within a limited period of time;
- harmonized operational requirements

I would eventually like to add a fourth condition, namely that each Country's operational requirement for the new vehicle be rather remote in time, in order to make available an adequate period of time for design and development (usually not less than 10 years) and also to provide the widest interval from the present industrial situation and so easily overcome currently consolidated interests.

4. Endeavors and Achievements of the Past

As a matter of fact no achievements have been recorded in the helicopter field that deserve to be defined "European", but only bilateral programmes which nonetheless have proved the advantages of joint ventures.

It is known to you all that the GAZELLE, LYNX and PUMA helicopters are the outcome of a French-British cooperation that has given excellent results.

More recently a cooperation has been initiated between Italy and Great Britain for the development of a naval, medium-size helicopter, the EH-101, in the frame of the so called Sea King replacement programme. This cooperation could branch off to include other Countries, on a broader and significant european basis.

Similarly, in other aviation and non-aviation sectors, other important multilateral programmes among European Countries have provided indisputed technological, economical and operational benefits.

Of all the benefits suffice it to recall the Multirole fighter TORNADO and FH-70 gun. On the other hand it is also necessary to make ourselves understood about the meaning to be attributed to the term "European" for we cannot think of a global commitment by all European Countries, least of all by the Countries member of the Atlantic Alliance and Common Market.

As regards the helicopter sector, reference must necessarily be made to those Countries which can rely upon a consolidated helicopter industry, capable of implementing significant coordinated programmes.

However being these programmes "European", as a matter of principle they must also be open to Countries with industries not specializing in this sector, through appropriate forms of cooperation and keeping into account to the extent possible, in the conceptual phase, the requirements of the military operators of such Countries.

5. Existing bases for a European cooperation in the helicopter sector

After a general review of the various aspects covering a European cooperation in the helicopter sector (benefits, difficulties and required conditions to implement it) we can now question ourselves whether so far the bases have been laid as required to implement concrete development programmes for new helicopter.

The answer is largely positive , for as a matter of fact, in this sector the favourable prospects rely upon a stable tripod comprised of:

- Understanding at Governments level;
- Industry Agreement;
- Mutual Conceptual Support

As regards the understanding at Government level, I refer to the Declaration of Principles, signed in 1978 by the Defence Ministers of France, Italy, Fed. Republic of Germany and United Kingdom, covering the European cooperation in the helicopter sector.

This important document represents the frame from which any future military helicopter programme must be sourced and establishes as well the guidelines for the definition of any single programme's specific accords.

Among the essential provisions of the Declaration I wish to mention some basic aims and principles.

Basic aims are:

- Increased standardization and interoperability by reduction in the number of helicopter types operated within the Atlantic Alliance;
- Reduction in costs and improvement of export prospects;
- Upholding in Europe of a strong and vital helicopter industry

The basic principles of the cooperation are:

- efforts at Government level to standardize future timetables and engineering requirements;
- definition of a managerial structure for every programme and fair sharing of responsibilities;
- development of a product line eligible for sale to other Countries;
- common policy towards Industry in order to promote a closer industrial cooperation;

- exchange of preliminary information and consultations before choosing new materiel, as well as attempts to meet the individual requirements by jointly developed helicopters in Europe;

- drive to obtain the same commitments from other European nations.

In harmony with the Declaration, the definition of a Memorandum of Understanding is presently in progress, aimed at establishing practical and concrete rules covering the implementation of cooperation programmes.

As far as instead the industrial accords are concerned, I wish to stress that since 1975 the four leading European helicopter industries - AEROSPATIALE in France, AGUSTA in Italy, MBB in the Fed. Rep. of Germany and WESTLAND in the United Kingdom - have signed a Memorandum of Understanding to the effect of establishing an active cooperation, in the firm belief that the European helicopter industry could better consolidate its long term position through the coordination of its activities.

I would like to hint that the outcome of the general cooperation agreement was the identification by the four above mentioned industries of a tactical transport helicopter as the aircraft eligible to implement their cooperation, as well as the definition of the areas in which advanced technological objectives had to be achieved. The new machine to be developed must be something really new and competitive on the helicopter market of the 1990's.

But we shall revert later on to this subject.

I have also spoken of a common conceptual support which is even more important than the agreements at Government and Industry level, since this is the expression of the rotary wing A/C operators' requirements, namely of the Armies of the leading European Countries.

This support is already existing and is delivered by that organization shortly called FINABEL, which comprises a Coordination Committee consisting of the Chiefs of Staff of France, Italy, Holland, Belgium, Fed. Rep. of Germany, United Kingdom and Luxemburg.

This Committee, established in 1955 with the endorsement of the respective Ministries of Defence, has the task of promoting military cooperation among NATO member Countries, in a mutual drive to define common guidelines for the coordination of the ground armament sector.

The Committee is backed by a great number of Workgroups among which is worth mentioning Group K, concerned with aeromobility of ground forces and air transportation.

This Group has so far defined three important agreements, approved by the Army Chiefs of Staff of the FINABEL Countries, covering the basic data for the study of future helicopter operational features:

- Light Anti-Tank;
- Medium Transport;
- Light Transport;

The definition of the future observation and liaison helicopter is currently in progress.

The validity of the work performed by the FINABEL Group (in which I was honoured to participate for 6 years) is demonstrated by the consideration attributed to the above mentioned agreements also outside the FINABEL sphere, both by the Military as well as by the Industry.

As a matter of fact, though these agreements reflect ground forces requirements, their validity is well beyond what may look like a conceptual and operational limitation.

I would eventually like to add that the european cooperation in the helicopter sector can now be projected beyond what is now termed as the "Helicopter Quadripartite".

Meeting points exist for all potential military operators for debating and comparing the different requirements and for promoting extensive cooperation ventures both in the military and industry fields.

One of them is offered for example by the so called Independent European Program Group which, under the supervision of the Armament National Directors, permits to compare the requirements of practically all NATO European members, thus extending the cooperation area.

III. THE TACTICAL TRANSPORT HELICOPTER

1. Verification of the conditions for a European Program

I will shortly recall which are, according to my opinion, the conditions required for the promotion of a European cooperation program, namely:

- availability of agreements at Government and Industry level;
- large production base;
- harmonized operational requirements;
- requirement rather remote in time.

The development of a tactical or light transport helicopter is likely to meet these conditions.

Agreements at Government and Industry levels have already been consolidated.

As regards the requirements of the individual Countries in terms of volume and referred to the timetables of the General Staffs for implementation, we can realize that the Armies of the "Helicopter Quadripartite" Countries as well as of other Countries, operate aircraft lines belonging to past engineering generations, which dating from 1990 and within the last decade of this century must necessarily be renewed.

Requirements for a similar-class aircraft also exist from the Navies and Air Forces of the above Countries.

These are some hundreds of aircrafts which under different configurations (multirole, general use, manoeuver, light transport, antisom) belong to that same category which identifies the payload for the basic operational mission with a weight corresponding to that of an organic squad of equipped troops, or equivalent material and operational equipment.

A last condition remains to be verified, namely the existence of a common operational requirement. So far this condition has not been implemented, but the necessary provisions to this effect are contained in the FINABEL Accord, covering the study of the future light transport helicopter operational requirements.

This important document is the outcome of the operational experience of the leading European helicopter operators, where the helicopter is viewed as the exclusive means to assist the ground Forces in acquiring an adequate tactical mobility level. Though not fully utilizable in support of a finalized project, the FINABEL Accord delivers the concrete and realistic picture from which the future helicopter features must be sourced.

This is actually a helicopter primarily devoted to meet the requirements of the ground forces, but its basic features shall have to be attractive to any other operator. Configuration and some performance changes shall have to be feasible with no difficulty, starting from a valid basic machine.

In this connection and with reference to the FINABEL Accord it should be easy for each Country to define in detail its own national operational requirements and then proceed to their harmonization with those of the other member Countries participating in the common development programme, in an attitude of sincere cooperation in view of the mutual benefits that can be derived.

2. Class of the future aircraft

So far in Europe and within NATO itself no precise definition exists as regards helicopters. This may seem strange in consideration of the efforts done for so many years to reach an acceptable level of standardization, at least, conceptual, in the various sectors. But it is so!

Two ways are usually followed to distinguish the various types of helicopters.

One which identifies the aircraft according to its operational roles. The other which refers to category or weight class.

Accordingly we have: observation and liaison, reconnaissance, scout, anti-tank, attack, multi-role, manoeuver, general use and transport helicopters.

Or light, medium and heavy helicopters otherwise also divided according to weight class up to 3 tons, 6 thru 8 tons and in excess of 12 tons.

I wish to stress again that these are classifications not governed by any regulation but adopted by individual Countries and International Organizations, according to different criteria.

For the aircraft that we are concerned with, FINABEL has adopted a mixed formula which concurrently identifies the role and class: "Light Transport Helicopter". But subsequently the term Light has been officially replaced with Tactical, in consideration of the prioritary utilization to which the future aircraft is to be devoted and the environment in which it is expected to operate.

I think this constitutes a very important conceptual change.

The "tactical" adjective in the military jargon, if applied to any vehicle will indicate that, that vehicle shall possess features consistent with the peculiar environment within which military tactics is implemented, namely the most advanced areas of the battlefield, where direct hostile threat is more impending and the vehicle is directly used in the fight to such an extent as to influence the outcome.

Mr. IVES ROBINS on No. 14 of MILITARY TECHNOLOGY, under the heading "More Mobility on the Battlefield" has written an interesting and exhausting article covering the helitransport role in ground operations.

My impression is however that he regards as valid for tactical helitransport, in the sense I have stated above, all current transport helicopters, from the classical UH-1 up to the CH series, unless he by this statement intends to refer generically to the mobility support that may be offered by the helicopter to the operational units.

I think instead that the same way a simple truck distinguishes from a troops transport vehicle, so a tactical transport helicopter shall possess specific features distinguishing it from a purely transport helicopter, though the distinction is not so evident as in the case of ground vehicles, since the installation of particular operational equipment and the application of advanced technologies could in the future constitute commonality features to every aircraft.

Consequently the tactical transport helicopter shall be understood to be a vehicle featuring an outstanding tactical capability achieved through the implementation of a formula which will harmonize as required dimensions, performance and protection measures, in order to obtain a balanced vehicle capable of flying the assigned basic operational mission with a high degree of survivability, namely helitransportation of a fully equipped squad in the course of airmobile operations in close enemy contact.

3. Current situation and auspicated progress

Nowadays in the western world and as far as aircraft consistent with the future tactical transport helicopter class are concerned, three engineering generations of helicopters are in service.

The first group comprises the BELL helicopters of the UH-1 series, conceptually born in the '50s.

The SA-330 PUMA from AEROSPATIALE, born in the '60s, belongs to a second generation.

And eventually the UH-60A BLACK HAWK from SIKORSKY, winner in the '70s of the UTTAS competition promoted by the US Army.

All these aircrafts have been designed according to military specifications different in relation to the time at which the respective programs have been consolidated and according to the particular operational requirements of the major operators.

While the BLACK HAWK has just entered service, the UH-1s and PUMAs have been in operation for many years both in the original configurations as well as in new and updated configurations which tend to bridge the generation gap with newly born aircraft.

As a matter of fact this aspect deserves some brief consideration. The helicopter engineering and operational flexibility enables a progressive updating so as to extend in the time the requirement for a replacement, with evident economical benefits for the operators.

Nonetheless, the modifications and changes to a formula established in the past and relating to different operational and technological requirements, can only be of limited extent and also limited may be the convenience to pursue the updating process, unless it is demonstrated above any reasonable doubt, that nothing more and better can be achieved starting from a completely new design.

I think this is the focal point of the problem concerning an European programme for a new tactical transport helicopter. It must be taken into consideration that such an aircraft, even if the first requirements of the operators shall have to be met at the beginning of the 1990s, shall remain in operation for at least the first two decades of the years 2000s.

In this respect, we military operators are looking forward to a decisive jump in quality, an effort by the designers to refine and integrate every convenient technological progress into a vehicle which, besides meeting the operational specifications also reflects for example the human

and energetic problems that will characterize the last years of this century.

Some of the aspects that I would like to mention are: low fuel consumption, cheaper and easier maintenance, safety and ease of operation, which would permit operation of the helicopter by personnel with a rating not exceeding the rating required to drive an armoured tank.

I believe that at least for the Armies this is an important problem, in consideration of the high number of aircrafts required and the difficulty in finding and training the necessary personnel.

These are the reasons why I think that the though excellent present aircraft can and must be replaced with something decidedly more advanced in all respects.

This is another item in favour of a European cooperation that shall develop not only in relation to a determined programme, but also move along a series of parallel programs covering the development of new technologies in order to provide for the hoped-for jump in quality from the present helicopter generation, in terms of safety, performance and operation economy.

These factors are not interesting to military operators only, but they are also and maybe even more interesting to civil operators which so far have seen the widespread use of the rotary wing checked by safety and economical reasons.

In this connection the coordinated efforts by Governments and Industry to establish parallel research programs are quite justified, since the resulting benefits will reach well beyond the military sector.

4. Additional roles for the tactical transport helicopter, outside the Army

The tactical transport helicopter, within the ground forces, shall constitute the backbone of a flight line consisting of:

- Light Multirole or Observation and Liaison Helicopters;
- Tactical Transport Helicopter;
- Medium and/or Heavy Transport Helicopters.

So far we have spoken of the tactical transport helicopter solely as an Army helicopter. Even if restricted to this role alone, a European cooperation program would nonetheless be justified, because of the predictable extensive requirements by the ground forces.

In any case I think that this aircraft will find additional possibilities of operation in the military as well as commercial sectors.

In the Military Sector:

- The Navy shall of course replace in '90s the current ship-based AS helicopters with more advanced aircraft, compatible however, with the shelter possibilities aboard light naval units.

  Special performance features as required by the particular operation concept - for example: extensive endurance and excellent hovering capabilities - will certainly be offered by the performance envelope relating to ground performance;

- The Air Force too, with the adoption of the future helicopter, besides meeting its internal light transport requirements, will also accomplish the institutional search and rescue task either by establishing an homogeneous line consisting of the new helicopter alone or a diversified line consisting of fixed and rotary wing aircraft.

Undoubtedly however, a European cooperation shall reflect a harmonization of the particular requirements of the three Armed Forces in order to achieve an acceptable compromise which will not penalize to a significant extent, any of the three planned operational concepts.

As regards commercial operation, though I do not specialize in this sector, I think that an aircraft in the class of the future tactical transport helicopter will represent the highest limit for an extensive utilization in the numerous aerial work activities, requiring a vehicle capable of sea and land operation, especially in mountainous and inaccessible areas.

Consequently, if large volume production prospects are confirmed to meet European military requirements, without considering the prospects offered by other markets, this helicopter could offer commercial operators the very favourable opportunity to purchase the best aircraft at the most convenient price.

As regards performance and features that commercial operators may require, I think the answer thereof is reflected by last year FORUM conclusions: all military and commercial operators essentially welcome higher safety and reduced operation cost as well as acceptable performance within the capabilities offered by a machine like the classical helicopter.

We all follow with great interest the progress accomplished in the following areas: tilt rotors, compound systems, ABC concepts, VTOL systems; but we think that at least one more generation of helicopters can offer us the best of what we want, pending the assessment of different and more appropriate engineering solutions.

5. The Operational Requirements of the Italian Army

Italy is an active member of the "Helicopter Quadripartite" both at Government and Industry level and we hope that the European cooperation may consolidate as soon as possible on various programs, such as for example the anti-tank helicopter (although at the time being, different ways are followed), or the medium-size naval helicopter for which as I already said, may exist favourable prospects for an enlargement of the Italo-British cooperation.

Realistically however, Italy views the tactical transport helicopter as the most responsive means to the conditions necessary for the implementation of an open cooperation program, not impaired by preconditional interests.

We are convinced that since the provisions for a cooperation at Government and Industry level already exist, is now necessary to lay a consolidated conceptual base, namely a common operational requirement as a prerequisite for any subsequent step.

To this end, the Army which is regarded as the principle operator of the future helicopter, has been entrusted with the definition of the operational requirements. These requirements shall then be compared and harmonized with the requirements from other Countries willing to participate in the program.

This work has now been done and the Army's operational requirements, integrated with special operational requirements from the Navy and the Airforce, have become the national requirements for the future helicopter.

Here of course I cannot offer a detailed description of such requirements but I will just outline some essential steps, stressing that in the face of a program projected ahead in the time and in order to verify whether it is possible and convenient to depart from current engineering solutions, the aim of the requirement is to conduct a provocative action against the technicians, to assess their reactions in the pre-feasibility phase of the design.

First of all I would like to underline that according to the Italian Army, the future helicopter shall concurrently be an aircraft specializing in a specific mission as well as a multirole helicopter, so as to find a wide utilization in the aeromobility sector.

Specialized, for it shall best cope with the role of the tactical helitransport of a fully equipped squad, in the most advanced areas of the battlefield, under direct or potential hostile threat.

As a Multirole aircraft it shall be capable of delivering logistic support, of operating as weapon or equipment platform for electronic warfare and battlefield surveillance and of conducting search and rescue operations in peace and war.

It shall be possible to conduct all planned missions under the extreme environmental conditions of the national territory, by day and night and in adverse weather conditions.

As regards the basic tactical helitransport mission, the future helicopter, fully equipped, with a crew of three and defensive weapons consisting of two light machine guns, shall be capable of airlifting a 9-man squad for a total 1300 Kg weight, over a 250 Km range, 2 h. and 30 min. actual flight endurance plus a 20 min. reserve including adequate tactical flight segments.

In these conditions the helicopter shall meet the performance requirements foreseen under extreme operation conditions and the fuel consumption shall be calculated for the most unfavourable condition.

It shall also be possible to fly the following additional helitransport missions:

- internally, alternatively:
  - . up to 13 passengers,
  - . 1500 Kg of material,
  - . 6 litters,
  - . one infantry ancillary vehicle.

- externally, a load equal to the aircraft useful load less crew weight and fuel necessary for 30 min. flight.
  This load shall not be lower than 2.500 Kg (desirable 3.000 Kg).

We are not looking for extreme and conflicting performance data. To speed (required max. continuous speed 350 Km/h) we prefer the capability to perform OGE hovering up to 2.000 m at ISA + 20°C conditions, as well as outstanding positive, negative, fore and aft and lateral acceleration capabilities, high maneuverability and stability features, capability to withstand high positive and negative dynamic loads.

Particular emphasis has been devoted to operation safety problems that must be tackled and solved in an harmonic context, featuring active and passive measures, special construction problems, use of special material, without disregarding the impact that performance and flight qualities may have on safety.

The logistic problem has been as severely evaluated, both under the aspect of the construction criteria (for example: modular construction, extensive component life, standardization of parts, ease of inspection and removal), as well as regards maintenance factors, possibility of system status automatic check and ease of servicing.

I will not go into details as regards on board equipment and systems; it is however evident that also in these segments the future helicopter shall feature not only the best and most advanced equipment on the market but preferably helicopter-dedicated systems and even systems specifically developed for a particular helicopter.

In this connection the technological challenge is not limited to airframe technicians alone, but also to system, equipment and engine technicians as well, who shall jointly implement the difficult compromise between performance, consumption, simplicity of manufacture, endurance, operation safety, concurrently keeping into due account, for example, the IR suppression problem.

I have reasons to believe that the above requirements are not a prerequisite for the Italian Army alone nor related to a single helicopter, but common to all potential operators of the future tactical transport helicopter, not excepting the operators of a possible commercial configuration.

IV. CONCLUSIONS

With my address I think I have demonstrated the necessity, usefulness and convenience in all respects, for a European cooperation in the helicopter sector, either under the military as well as commercial operators viewpoint.

This cooperation is nowadays possible, for the necessary bases have been laid at Government and Industry level, in the form of agreements which we hope will develop beyond the good intentions stage.

The tactical transport helicopter represents a good opportunity for a European program accessible not only to the home Countries of the leading helicopter industries, but also to other Countries having a requirement for such an aircraft and which could derive benefits from such a program not only in terms of clearing but also from the manufacture of ancillary components or equipment.

Moreover in conjunction with the design and development of the helicopter, other programs may be launched covering the development of advanced technologies which represent objectives going well beyond a specific machine, but in favour of the entire helicopter sector.

I will eventually stress that European cooperation in the helicopter sector will and shall not mean relinquishing any form of cooperation with other areas and in particular with the transatlantic area. This cooperation should instead be viewed as a combined effort by Europe to bridge any existing technological gap and thus contribute to technical progress from a position of complete autonomy but with as much readiness to cooperate, in view of further mutual benefits and progress.

I wish to thank you for your kind attention and remind you that I have spoken as a soldier to representatives of the industry and scientific world, not only with a view to outline our requirements in the firm belief that the classical helicopter will be retained as the eligible means to implement

the tactical mobility of the ground forces, but also in the hope that those of you who belong to the European area, may contribute, through the channels available, to the construction of Europe also by way of a cooperation in the helicopter sector.