

# International Cooperation in Space Activities in Europe, the Ariane 6 Project Example

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## Abstract

On the 2<sup>nd</sup> of December 2014, the ESA ministerial conference decided on the development of a new Launch System for Europe: Ariane 6. In order to ensure an independent European capability to access Outer Space the ESA Member States agreed on the end of the Ariane5 Programme and expressed their will of a new launcher (Ariane 6) to remain competitive on the launch market.

This high level decision has raised multiple issues. One of the most important one concerns the relations and roles between all actors involved in the launch sector in Europe for this new project, to ensure the success of the launch services on the commercial and the institutional markets. In other words, the main question to be answered is the legal framework of such an important cooperation in space activities.

The Ariane 6 project is a precursory programme for the European Space Agency in terms of a new procurement approach with industry. In fact, in order to make the industry responsible for the proper achievements of the project, ESA and its Member States decided to financially involve industry. This objective required a new distribution of the responsibilities.

In the development of the Ariane 6 Launch System, which includes the development of the Launcher System including the delivery of a flight model for the Maiden Flight, and the development of the Launch Base, ESA will have the major role of Procurement Entity and of ensuring the coordination of the interfaces between the Launch System and the Launch Base. Even though the development contracts for the Ariane 6 projects have been signed in August 2015, many questions on the share of responsibilities are not clear for the development phase. This is even more true for the exploitation phase for which the distribution of roles are uncertain.

This paper aims to address the responsibilities of the main actors of this project in development and in exploitation.

**Keywords:** Ariane 6 governance, Ariane 5, Ariane launchers family, ESA.

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## **1. Introduction**

Since 24<sup>th</sup> December 1979 and the first launch of an Ariane Rocket, the European Space Agency (ESA) has known up to today an impressive success of the Ariane family. Ariane 5, which is the present launcher of the Ariane family exploited, has only noted 4 failures out of the 95 launches and is thus ramping up as being the safest launcher in the world with a record of 95.7 % success rate. Besides the Ariane 5, ESA is as well having today launches of the VEGA Launcher and the SOYUZ Launcher from French Guyana.

The Ariane rocket family is an European civilian expendable launch vehicle for space launches (but not meant for human space flights) used for governmental mission as well as commercial purposes.

The Ariane Programme is an optional programme at ESA including the main ESA Member States and showing a great international cooperation in Europe to ensure an independent access to outer space for Europe. Industrials located in all the participating States in Europe of the Ariane programme work on the production of the current version of Ariane 5 and ensure the continuity and successes of the launches.

This cooperation is further improved and continued as on 2nd of December 2014, the ESA ministerial conference decided on the development of a new Launch System (LS) for Europe in order to ensure an independent European capability to access Outer Space: Ariane 6. This new launcher is aimed to adapt the Ariane rocket family in order to ensure the competitiveness of Europe on the world market. Ariane 6 is currently under development with a first test flight scheduled in 2020. The main manufacturer (commonly designated as Prime Contractor) is called ArianeGroup SAS (previously called Airbus Safran Launchers – ASL). Ariane 6 will be declined into two different versions: Ariane 62 and Ariane 64.

This new launcher development is accompanied with a new governance scheme, in comparison to the Ariane 5 scheme, redefining the roles and responsibility of each actor to ensure the success of the launch services on the commercial and the institutional markets.

This paper is aimed to give a brief overview of the legal consequences of such a change of governance.

## **2. The Context**

The two most important findings of the ESA ministerial in 2014 are

1. the exploitation of the Launch System without public support to commercial exploitation,
2. and the transfer of risk to the private sector.

In other terms this means that the private sector is having a much higher responsibility, than it was the case for Ariane 5, in the execution of the

development, but even more during the exploitation phase. Indeed, the public entities have decided to provide industry with the so called Design Authority, meaning that the Prime Contractor is responsible for the design choices and shall thus repair any possible shortfall due to design choices. The Primes are responsible for their technical design choices and are thus entrusted with a larger liability and shall to commit to a related Product Warranty.

In particular, in order to ensure a sustainable development and exploitation, it is implied to be aware inter alia about who is responsible for the design of the Launch System and its elements (the Launcher System and the Launch Base) and who is therefore able to provide the related warranties and what legal framework is given to ensure it.

In order to answer this question, two points have first to be raised: Having a look to the Ariane 6 timeline (but which is comparable to all launchers developments), three different periods can be distinguished:

1. The Development phase: which started with the signature of the development contracts (in the case of Ariane 6 on the 25<sup>th</sup> July 2015).
2. The Transition Phase: starting with the Maiden Flight (test flight of a first Ariane 6 scheduled on 2020) and ending once the launcher is fully operational.
3. The Exploitation Phase.

The roles and responsibilities of each actor might not be the same depending of the phase. The Development phase is the cornerstone for a successful future exploitation phase as it allows to anticipate potential issues arising in exploitation.

Currently the main actors are the following:

- ASL (ArianeGroup SAS, previously Airbus Safran Launchers) is responsible for the Launcher System, meaning the Rocket itself.
- CNES (the French Space Agency) is responsible for the Launch Base (the Launch Path) in Kourou (French Guiana)
- And ESA as the Procuring Entity in the development phase and the Launch system Architect, meaning ensuring the coherence between the Launcher System and the Launch Base. As the Launch System Architect, ESA will define the architecture of the Launch System (LS) and, will procure its two main elements: the Launcher System and the Launch Base.

Going back to the two findings of the 2014 ESA Ministerial Conference (exploitation of the Launch System without public support to commercial exploitation and the transfer of risk to the private sector) the question is now how these actors can fulfil their obligation with the current legal framework. This scheme is still to be fully put in place as the development phase is still in its beginning period. Discussions are however already taking place to explore

possible ways on how the roles and responsibilities are distributed in the exploitation phase.

This part of the Ariane 6 project is completely uncertain, as no exploitation contracts have been signed yet and it remains unknown who will be responsible for the Launch System. It is only during this exploitation phase that lessons learned on the effectiveness of the new Ariane 6 Governance scheme can be analysed.

### 3. Legal Analysis

For the procurement of the Launcher System and/or the Launch Base in the development and/or the exploitation phase, two different contractual schemes can theoretically be envisaged: a service agreement or a sale contract. This distinction rules the validity of certain clauses concerning the Defect/ Product Warranty and the Design Warranty under French Law. Indeed as the two main contractors for the development contracts are French, the paper is focusing on French law on purpose.

The service contract should be understood in the following lines as covering any activity through which someone executes a work against remuneration. One party to the contract is the initiator of the project, whereas the other is selected by the initiator to realise it.

In cases of service contracts, the one executing the work bears the responsibility to deliver the work in time and as requested by the initiator and reflected in the contract. Meaning that if the work is delivered against the provision of the contract, the executor of the work shall keep the risk and pay for the delta.

A sale contract is understood to be the delivery of the contractually determined product by the seller and the payment of the buyer. Moreover, under French law, the French jurisprudence has as well included the obligation of the seller to guarantee the product after delivery.

French Law distinguishes between three potentially cumulative warranties:

1. Warranty of conformity (*Obligation de conformité*<sup>1</sup>):<sup>2</sup> The seller must deliver a product in compliance with the contract's provisions.<sup>3</sup>
2. Hidden defects warranty (*Garantie des vices cachés*<sup>4</sup>): The seller must deliver a product without hidden defects that make the product improper for the intended use or allow only restricted use for which the buyer would have paid less, if he would have been aware of them, or wouldn't even have bought the product.

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1 Article 1604 French Code civil.

2 French case law makes a distinction between the warranty of conformity and the hidden defects warranty (Civ. 1ère, 8 déc. 1993, Bull. Civ. I, No 362).

3 Civ. 1ère, 1er déc. 1987, Bull. Civ. I, No 324.

4 Article 1641 French Code civil.

3. Liability for defective products (*produits défectueux*<sup>5</sup>): The seller is liable for damages to persons or other goods due to the defective product. The lack of conformity or the hidden defects of the product itself must be sought following the rules above (1 and 2). In the launch sector this liability can have huge (financial) consequences. In fact, considering the contract is a sale contract, should the Launch System or the Launch Base be defective during the Maiden Flight, it could cause damage to the payload(s), to the Launch Base, to the Launch System or to third parties. Even though the entity suffering the damage has to prove the damage, the failing and the causal link between them,<sup>6</sup> the entity selling the Launch System, the Launch Base or the launch service could be held liable for the failing even if the Launch System or the Launch Base has been built according to the rule book.<sup>7</sup> The seller could only escape its liability by proving that the failing could not be detected with the actual scientific and technical knowledge<sup>8</sup> (State of the Art).

The limitation or exclusion of warranty of conformity and for hidden defects would be in principle invalid in a sale contract. One exception exists for sale contracts between professionals. It is very likely to consider that a French Court would conclude that all actors involved in the launch sector are professionals.

In the frame of the Ariane 6 Programme, besides the Defect/ Product Warranty, the “seller” of the Launch System and the “seller” of the Launch Base are expected to guarantee that the design of the product is able to achieve its goal. This warranty shall play in cases of Design Shortfalls. Even if the warranty is applied before the exploitation of the Launcher System the real question behind is a liability and financing issue in exploitation: if ArianeGroup SAS is the Design Authority of the Launch System, and, as such, decides upon its design choices, in cases of Design defect on the Launcher System appearing during the exploitation of the Launch System, ArianeGroup would have to remedy them at its own expenses. The warranty starts at the same time than the Defect/ Product Warranty, once the product is delivered and accepted. However, the end of the Design Warranty cannot per definition be the same as for the Defect/ Product Warranty: once launched, the launcher as a product cannot be reused. So the Defect/ Product Warranty lasts until the end of the mission of each launcher whereas the Design Warranty shall however continue to last during the complete

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5 Article 1386-1 French Code civil.

6 Article 1386-9 French Code civil.

7 Article 1386-10 French Code civil.

8 [Article 1386-11, 4 French Code civil], Article 7 European Directive 85/374/CEE, 25 July 1985.

exploitation of the Launcher System and Launch System, since other launchers based on the same design will be manufactured. The Defect/Product Warranty is therefore meant to warrant that every product is built without production defects according to its design, and the Design Warranty is meant to warrant that the design of each product is able to achieve its goal. Depending on the needs expressed in the contract the right warranty and warranty period shall be included. In any case a product warranty must be included as ESA wants the delivery of the Launcher System and the Launch Base in due time and due form. Here the new governance scheme put in place for Ariane 6 will play an important role.

In principle the chosen contract for the exploitation phase of Ariane 6 will be a mixture of a service contract and a sale contract adapted to the very specific needs of the launch sector. Indeed, only the combination of the clauses and principles of these two types of contracts, will allow in the understanding of the author to overcome main issues which might arise with the new Ariane 6 governance scheme.

#### **4. Conclusions**

The legal impact and consequences of this new governance scheme for Ariane 6 scheme put in place might only be completely assessable once the exploitation phase has started and shown its first lesson learnt. It is however already now in the development phase that the legal and contractual cornerstones are settled for the whole life of the Ariane 6 programme. Ariane 6 is an incredibly challenging programme for Europe not only in legal terms, but is ensuring Europe's competitiveness on the launchers market.