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## **THE MAIN RISKS IDENTIFIED IN THE MULTIROLE AIRCRAFT PROCUREMENT**

**Cpt. cdor. Constantin NUȚĂ**  
**Research and Flight Test Center/Craiova/România**

**Abstract:**

This paper aims is only to identify specific risks during the Multirole Aircraft Acquisition Program, in this context below are some considerations relating only to this stage. In order to manage risks in a complex process as a program for acquisition of this size, it is necessary first of all to know that these risks. Risks must be identified at any level where there are noticeable consequences on the objectives and specific measures can be taken to solve. To provide well-defined image regarding risks of the program, the risks identified should be grouped according to the relevant criteria for the acquisition process.

*Key words: Risk management.*

### **1. Introduction**

**As defined in the Department’s Glossary of Risk Management Term “RISK” is defined as “... the change of something happening that will have an impact on objectives. It is measurement in terms of consequences and likelihood.”**

Risk management is a systematic, proactive, and iterative endeavor that seeks to efficiently and effectively identify risks, prioritize them, develop response strategies and provide the necessary information at the appropriate time in order to minimize the impact of unfavorable events (threats) and maximize the benefit of favorable events (good risks), called opportunities.

The level of detail and effort required to manage risk in procurement will vary depending on the nature and value of the procurement.

The purpose of risks management is to help ensure cost, schedule, and performance objectives are achieved at every stage in the lifecycle and to communicate to all stakeholders the process for uncovering, determining the scope of, and managing projects uncertainties. Without effective risks management the program or project managers may find themselves doing crisis management, a resource intensive process that is typically constrained by a restricted set of available options.

The benefits of risks management are to support the realization of program, project, but also System of Interest (SOI) objectives throughout the life cycle, and support the following aspects:

- Program/project as well as life cycle costs overrun are minimized.
- Schedules are met, reducing delays and allowing the investment they represent to be fully utilized.
- All deliverables meet their requirements, preventing costly repeats or top up activities that would otherwise be required to deliver the shortfall.
- The program and project specific requirements (e.g. legal or statutory) are appropriately addressed.

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As a guide, the following key steps in the risk managed process are provided for consideration when undertaking procurement:

- Risk management planning;
- Risk identification;
- Risk analysis and evaluate;
- Risk treat;

## **2. Stages of procurement program**

Running program aims is to endowment Rumanian Air Forces with a Multirole Aircraft to have the technical and operational performance required to fulfill specific missions of Multirole Aircraft as presented in Mission Needs Document and Operational Requirements Document approved. The specific objectives arising from the program stages, as shown in the diagram in Fig. 1. To achieve objectives must address a complex strategy, which include:

- A structural component - responsible for ensuring the necessary legal framework of the procurement program and it interfacing with the political, social and economical framework;
- A technical component - responsible for reach technical objectives (including technology) of the program and necessary condition achievement enable to successful procurement program implementation;
- A budget component - responsible for planning and providing/justification of necessary funds;
- A contractual component - responsible for ensuring the necessary conditions in order to develop the contractual procurement program;
- An operational component - responsible for the implementation, operation and support during the entire life cycle of the product.

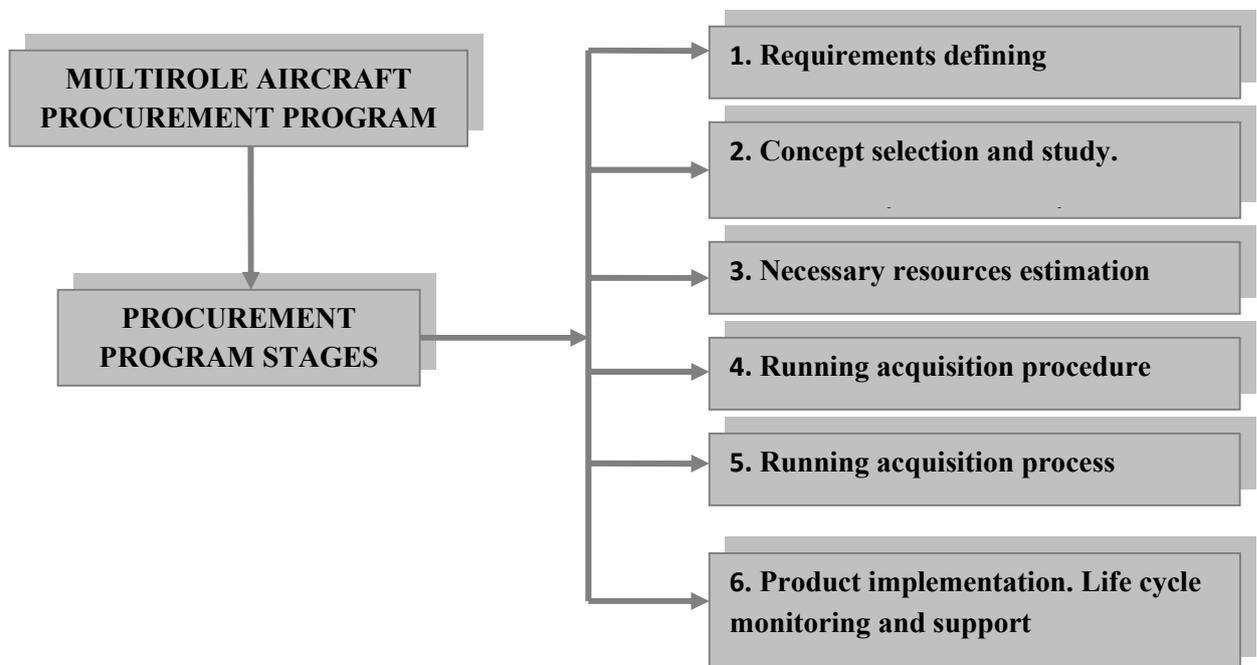


Fig.1: Stage of procurement program

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## **3. Main risks of procurement program**

### **3.1. Impact Rating**

Risk impact is another risk attribute. It is used to characterize the effect of the risk (if it would happen). Impact should be assessed against the project objectives, and may be quantified in each of the following project areas: cost, schedule, and technical performances. Rules and guidelines to quantify and qualify impacts ( see Table 1).

<b>Risk impact level</b>	<b>Impact criteria</b>		
	<b>Technical performance</b>	<b>Schedule</b>	<b>Cost</b>
1	Severe degradation in technical performance; Cannot meet key technical/supportability threshold; will jeopardize program success	Cannot meet key Program milestones.	> 10% over total estimated cost
2	Significant degradation in technical performance or major shortfall in supportability; may jeopardize Program success	Program critical path affected. Slip < 0.5-1 year.	< 10% over total estimated cost.
3	Moderate reduction in technical performance or supportability with limited impact on Program objectives	Minor schedule slip. Able to meet key Program milestones with no schedule float. Slip < 3-6 months.	< 5% over total estimated cost
4	Minor reduction in technical performance or supportability, can be tolerated with little or no impact on Program objectives	Able to meet key dates. Slip < 1month.	<1% Over total estimated cost
5	Minimal or no consequence to technical performance.	Minimal or no impact.	Minimal or no impact

Table 1- Example of impact rating

### **3.2. Risk Rating**

A risk rating is the combination of the probability and impact ratings. A probability and impact matrix determines a risk rating which expresses the overall risk assessment and is used to support the development of appropriate risk responses. In Fig. 2, the combinations of 3 different probability and impact ratings lead to a risk being rated as “high”, “moderate”, or “low”.

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		Probability rating		
		Unlikely	Likely	Very likely
Impact rating	Minor	Low	Low	Moderate
	Medium	Low	Moderate	High
	Major	Moderate	High	High

Fig.2: Example of basic probability and impact matrix

Below show a more elaborate matrix where four different risk ratings are defined (critical, high, moderate, and low) and where disastrous and major impacts are assessed to be critical even if they have low probabilities. This matrix could be used for instance for the technical risks of a safety critical product.

The organization or project must develop or adopt an appropriate probability and impact matrix with clear descriptions of impact ratings, for instance in terms of delay, costs, or quality. Depending on the probability of risks throughout the program we can highlight the following frequencies:

Extremely unlikely	Very unlikely	Likely	Very likely	Extremely likely
$0.001 < P < 0.01$	$0.01 < P < 0.02$	$0.02 < P < 0.1$	$0.1 < P < 0.5$	$0.5 < P < 1$

Depending on the probability of risk and the degree of impact on the program we can highlight the following categories of risk:

Critical	High	Moderate	Low

Depending on the probability of risks and their impact on the program we can define risk matrix diagram show in Fig. 3:

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		Probability rating				
		Extremely unlikely	Very unlikely	Likely	Very likely	Extremely likely
Impact rating	Disastrous					
	Major					
	Medium					
	Minor					
	Insignificant					

Figure 3: Example of probability and impact matrix for avoidance of risks with high impact ratings.

### **4. Main risks identified in the procurement program**

Identifying principal risks of the program is in close correlation with the program stages. To identify the key risks in the analysis we start from the simple elements which contribute to the main stages of the procurement program as shown in the diagram in Fig. 1.

Associated risk each element in the diagram in Fig.1, result the risks of the procurement program (see Table 2).

Stage in program development	Identified risk	Consequences and associate risk
<b>Requirements define</b>	<b>1. Setting incorrect requirements regarding product capabilities and operational performance relative to goals and missions</b>	<b>1.1.</b> Additional costs due overvaluation needs.
		<b>1.2.</b> Non accomplishing objectives assumed due the wrong evaluation.
		<b>1.3.</b> Procurement process delays due to an insufficient correlation between needs and existing technological possibilities accessible our country.
<b>Concept selection and study (Market Study)</b>	<b>1. Subjective evaluation of existing products on the market or potential suppliers that have the capability of product development to meet the requirements</b>	<b>1.1.</b> Wrong design of the necessary funds.
		<b>1.2.</b> Misidentification products and potential suppliers that accomplish the requirements and possible options for acquisition.
	<b>2. There are not necessary conditions assured for</b>	<b>2.1.</b> Wrong design of the necessary funds.

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<b>Stage in program development</b>	<b>Identified risk</b>	<b>Consequences and associate risk</b>
	<b>market study.</b>	<b>2.2.</b> Misidentification products and potential suppliers that accomplish the requirements and possible options for acquisition.
	<b>3. Lack of regulations concerning necessary information obtaining for the market study and intergovernmental agreements on access to classified information.</b>	<b>3.1.</b> Altering results due to the use of low trust level data.
		<b>3.2.</b> Difficult initiation of the official dialogues in order to obtain consistent data from potential suppliers.
		<b>3.3.</b> Ignoring data verification practices commonly used in practice of such programs, based on modern testing and evaluation methods.
		<b>3.4.</b> Arbitrary methods application to obtain information and favoring to obtain unchecked results.
	<b>4. Lack the necessary expertise</b>	<b>4.1.</b> Difficulties in objective evaluation of existing products on the market.
		<b>4.2.</b> Using assessment methods and criteria not adapted to current technological performance.
<b>4.3.</b> Using the improperly data information and wrong conclusions elaborating.		
<b>Necessary resources estimation</b>	<b>1. Using the incorrect personnel evaluation criteria</b>	<b>1.1.</b> Program costs increase due to increasing training period and program delay implementation;
		<b>1.2.</b> Not assimilating necessary information for the correct product operation.
		<b>1.3.</b> Increased risk of incident;
		<b>1.4.</b> Increased operating costs.
	<b>2. Incorrect funds assessment necessary for carrying out of the acquisition program</b>	<b>2.1.</b> Deficiencies in providing necessary financial funds for carrying out of acquisition program
		<b>2.2.</b> Delays in acquisition program implementation;
		<b>2.3.</b> Difficulties in meeting operational objectives and obligations assumed.
		<b>2.4.</b> Inefficient use of financial resources.
<b>Running acquisition procedure</b>	<b>1. Risk arising due specify law in public acquisition domain</b>	<b>1.1.</b> Delays in the program implementation due to time stipulated by the legislation omitted in the assessment and planning stages.

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Stage in program development	Identified risk	Consequences and associate risk	
		1.2. Budgetary difficulties due to specific legislative provisions omitted in the assessment and planning stages.	
		1.3. Financial difficulties arising from budgetary priorities and the need to manage a new situations arising after the initial evaluation and planning stages.	
		1.4. The impact of new regulations arising after unrolling assessment and planning stages.	
	<b>2. Risks regarding elaborating acquisition documents and tender evaluation. Complaints.</b>	2.1. Ambiguities in acquisition documents content which require clarification in the evaluation stage.	
		2.2. Incomplete documentation of acquisition.	
		2.3. Inadequate composition of the evaluating commission/commissions for offers.	
		2.4. The use of some evaluation criteria witch are inadequate to the specific nature and the complexity of the aquisition.	
		2.5. Delays in the unfolding of the programme due to solving the legal contests.	
	<b>Running acquisition process</b>	<b>1. Technical risks</b>	1.1. Tehnical risks associated with non-compliance with the operational requirements.
	1.2. Tehnical risks associated with the non- fulfilment of tehcnical and functioning requirements.		
1.3. Tehnical risks associated with the on- fulfilment of the characteristic feature of the logistic system.			
1.4. Tehnical risks ue to the maturation of the technologies that have been used to manufacture the product.			
1.5. Tehnical risks due to the tehcnical capacity and experience of the provider.			
1.6. Tehnical risks due to the certification or acceptance methods of the final product			
1.7. Technical risks due to the control and supervision methods of quality in the technological process of			

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<b>Stage in program development</b>	<b>Identified risk</b>	<b>Consequences and associate risk</b>
		manufacturing
		<b>1.8.</b> Tehnical risks due to non-compliance with some standards that are required by the assigning documentation.
	<b>2. Financial risks</b>	<b>2.1.</b> Inadequate budgetary estimation panning and progamming with are not in correlation with the deadlines stipulated in the contracts of supplying
		<b>2.2.</b> Budgetary fluctuation due to the political- economic context.
		<b>2.3.</b> Budgetary fluctuation due to the political-economic context.
	<b>2.4.</b> The granting of the financial resources that are necessary to the unfolding of some unplanned related activities, with implication in the development of the activities stipulated by contract.	
	<b>3. Risks of the other possible activities</b>	
<b>Product implementation. Life cycle monitoring and support</b>	<b>1. Insufficient funds for the product operation</b>	<b>1.1.</b> Decreasing flight safety and security
		<b>1.2.</b> Low operational efficiency
		<b>1.3.</b> Inconsistency in personnel training
	<b>2. Inadequate infrastructure for product operating requirements</b>	<b>2.1.</b> Low operational efficiency.
		<b>2.2.</b> Additional operating costs
	<b>3. Deficitary personnel training</b>	<b>3.1.</b> Low operational efficiency
		<b>3.2.</b> Decreasing flight safety and security
	<b>4. Inadequate personnel structure of the product operating requirements</b>	<b>4.1.</b> Improper dimensioning program team involved in the program implementation
		<b>4.2.</b> Low operational efficiency
	<b>5. Inadequate logistical support in operating conditions</b>	<b>5.1.</b> Decreasing flight safety and security
		<b>5.2.</b> Low operational efficiency

Table 2- The main risks identified in the procurement program

Identified risk categories, their ranking according to the impact level on the procurement program are presented in Table 3.

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Stage in program development	IR	AR	Impact level				
			Disastrous	Major	Medium	Minor	Insignificant
Requirements define	1	1.1.			X		
		1.2.	X				
		1.3.				X	
Concept selection and study (Market Study)	1	1.1.				X	
		1.2.	X				
	2	2.1.			X		
		2.2.	X				
	3	3.1.		X			
		3.2.					X
		3.3.				X	
	4	3.4.		X			
		4.1.		X			
		4.2.				X	
4.3.		X					
Necessary resources estimation	1	1.1.		X			
		1.2.		X			
		1.3.		X			
		1.4.				X	
	2	2.1.			X		
		2.2.			X		
		2.3.					X
		2.4.			X		
	3	3.1.		X			
		3.2.		X			
3.3.				X			
3.4.					X		
Running acquisition procedure	1	1.1.				X	
		1.2.					X
		1.3.				X	
		1.4.				X	
	2	2.1.				X	
		2.2.					X

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Stage in program development	IR	AR	Impact level				
			Disastrous	Major	Medium	Minor	Insignificant
		2.3.			X		
		2.4.			X		
		2.5.					X
Running acquisition process	1	1.1.	X				
		1.2.		X			
		1.3.			X		
		1.4.				X	
		1.5.				X	
		1.6.				X	
		1.7.			X		
		1.8.			X		
	2	2.1.			X		
		2.2.				X	
		2.3.			X		
		2.4.					X
	3		*	*	*	*	*
Product implementation. Life cycle monitoring and support	1	1.1.		X			
		1.2.			X		
		1.3.			X		
		1.4.		X			
		1.5.			X		
	2	2.1.		X			
		2.2.		X			
		2.3.				X	
		2.4.					X
	3	3.1.		X			
		3.2.		X			
		3.3.				X	
	4	4.1.					X
		4.2.		X			
		4.3.				X	
	5	5.1.		X			
		5.2.				X	

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Stage in program development	IR	AR	Impact level				
			Disastrous	Major	Medium	Minor	Insignificant
		5.3.				X	
		5.4.		X			

Table 3- Risks impact level concerning the procurement program

**IR** - Identified risk;

**RA** - Associated risk

\* - Can be any impact level on the program

Improper identified risks treatment or untreated may conduct to blockage of the procurement program, exceeding the planned deadlines, additional costs, providing limited capabilities to perform the approved tasks or failure during operation safely.

**5. References:**

[1] NATO STANDARDS-ARAMP-1, *NATO risk management guide for aquisition programmes*, February 2012, pages [4],[10].

[2] Department of Education and children's Services, *Managing risk in procurement guidelines*, Guideline ID no MR 2961/2004, pages [3].