

## RISK MANAGEMENT IN MAJOR ACQUISITION PROGRAMS

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**Abstract:** *The paper analyses the particularities of risk management in major acquisition programs (acquisition of complex defence systems) and identifies technical risks. In the framework of risk management in major acquisition programs, the following elements were analysed: the relation between risk and the process of military acquisition; the acquisition process in the military acquisition and risk management phases; the risk and the characteristics of the acquisition process.*

**Keywords:** decision, risk management, acquisition management, military acquisition, program

### 1 The relationship between risk and military acquisition process

The military acquisition process has been designed on phases and decision points to allow for risks to be controlled, from conception to delivery of a system[1]. This approach involves the need to analyze the future phases of the program to identify potential risks and make their management decisions (figure 1).

The risk is inherent in all procurement programs and must be controlled by managers at all levels to ensure that all the objectives of the program are met. Thus, it is necessary for program managers to develop, from the initial stages of the procurement process, a comprehensive risk management strategy that complements the procurement strategy and establishes and maintains risks at an acceptable level as the program evolves in time[2].

Risk can also be defined as the variation in

real values over the average values or those we expect, variations that are due to accidental causes.

In this process, the risk assessment must be performed to systematically control the level of uncertainty in the program's ability to meet the cost, achievement and performance objectives.

Specifically, in the area of supply and logistics management, there are decision-makers (Certification Supervisory Board, Defence Planning Council, Procurement Council - CCS, CPA, CODA) that have to take decisions with a certain degree of risk assumed. This degree of risk must be estimated, tracked, verified, controlled, and continually reduced.

The procurement process within the Ministry of National Defence consists of a succession of phases assigned to mitigate risks, ensure permissibility and provide appropriate information for decision-

making[5]. Procurement authorities should encourage the creation of programs that

eliminate phases or activities that result in low return on endowment or cost savings.

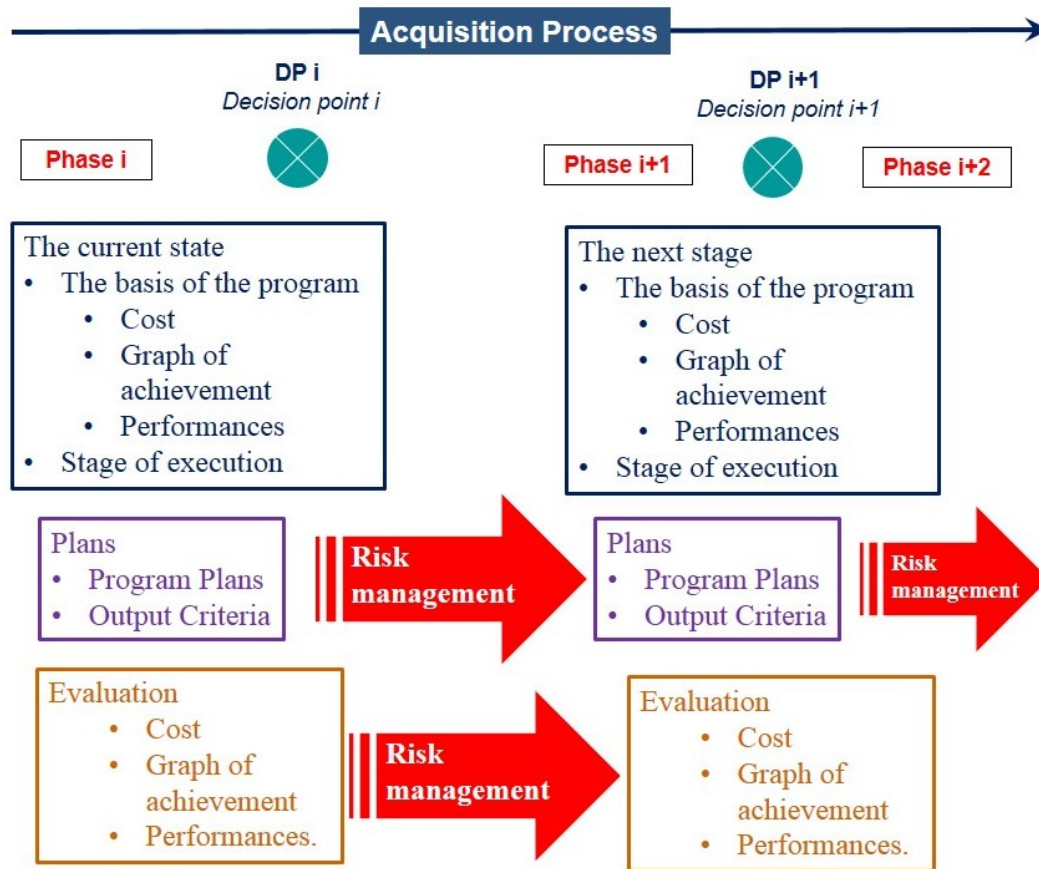


Figure 1: Acquisition process in the national defense system  
Source: Processing after[3], [14], [15]

For the actual development of a procurement program, it is necessary to assess (estimate) and determine the risks present in the procurement and to develop a risk management plan.

The Ministry of National Defence's policy, which uses public funds for procurement programs, requires continuous risk assessment, starting with the initial procurement stage, and the development of management methods, before any decision is made (at the decision point, DP) and in all subsequent phases[8].

The application of risk management processes (planning, evaluation, identification, analysis, approach and monitoring) is particularly important in Phase 0 "Study and Selection of the Concept", Phase 1 "Defining the Program"

and Phase 2 "Technological Development" of any program, when evaluating alternatives, set the objectives of the program and develop the procurement strategy[6], [13].

As a program evolves in later phases, the nature of the risk management effort will change. New evaluations will build on the previous ones. Risk areas will become more specific as the system is defined[4].

## 2. Procurement process in the army. Acquisition phases and risk management

The acquisition phases (according to I.1000.2-01) and the documents drawn up for each decision point, aim at managing risk, in order to enable decision making at decision points. In short, the phases and decision points are as follows (figure 2).

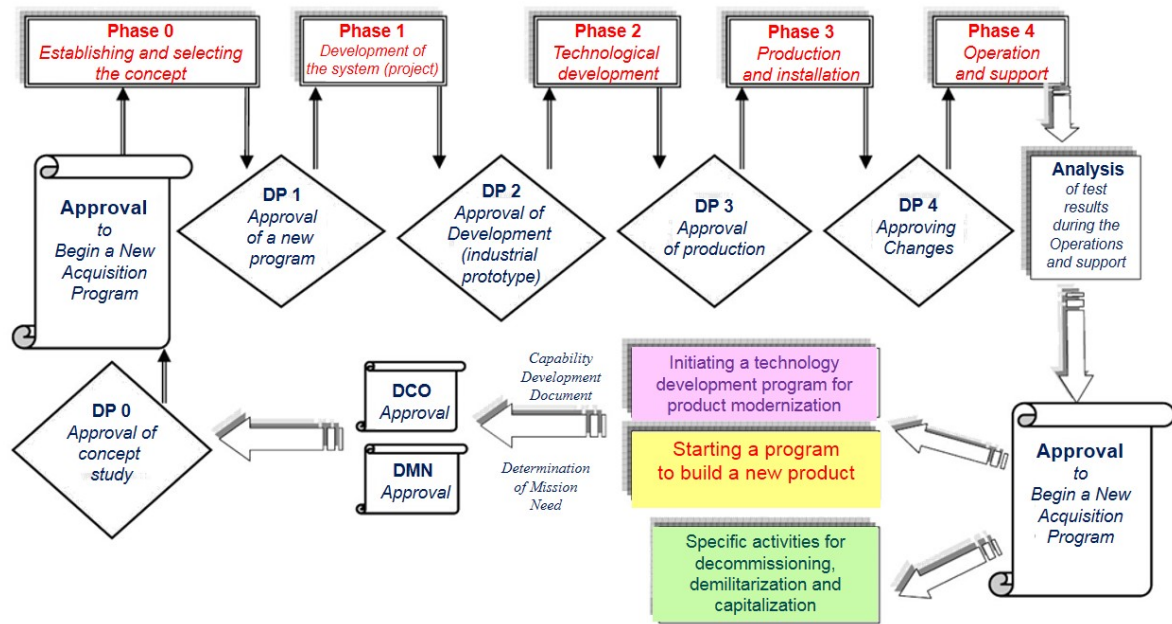


Figure 2: Acquisition phases and decision points  
Source: Processing after [6],[7], [16]

Phases and key points (decision points) of the acquisition process provide a linear structure and highlight risk management and permissibility.

Phases are a logical means of progressive translation of mission needs, well established in system-specific requirements, well-defined and, ultimately, in efficient systems that can survive from an operational point of view. It is important to remember that the term « system » includes hard, soft and human element. Each phase is designed, among other things, to control risks. Each major decision point allows evaluating the status of the program and the opportunity to analyse the plans for the next phase and the following.

### 2.1 Decision point 0 (DP0) - Approval of concept study, Phase 0 - Establishing and selecting the concept

Risk management is highlighted in studies defining and assessing the feasibility of alternative concepts, benefits, disadvantages and risk, analyses and information to identify areas of risk and ways to reduce it.

A new program is actually being approved, and risks become “palpable” by introducing

standards into system specifications.

### 2.2 Decision point 1 (DP1) - Approval of a new program, Phase 1 - Development of the system (project)

The following activities are carried out:

- more complete definition of critical design features;
- conducting the development test to determine the degree of risk, for the program, of the new technologies;
- reviewing the procurement strategy to identify high risk areas, risk management, initial production batch.

All of this is to carry out prototypes, experiments, and initial risk mitigation assessments, including financial, before reaching the next DP.

### 2.3 Decision Point 2 (DP2) - Approval of Development (industrial prototype), Phase 2 - Technological development

DP2 validates the results of Phase 1 and approves the transition to Phase 2 - transforming the best design variants into a project that meets operational and interoperability requirements and can be manufactured, operated and maintained effectively.

It is an extremely important phase, because

by approval, it allows the translation of the most efficient project, developed in phase 1, into a reproducible system. In the technological development phase, depending on the results of the tests carried out on the industrial prototype, the Low Rate Initial Production (*LRIP*) can be achieved. LRIPs for all programs will be minimal (up to 10% of the total production approved in the strategy), and if exceeded, the decision-making authority (AD) of DP3 takes the decision to continue or interrupt the program.

Risk management will be updated whenever a change in the approved acquisition strategy occurs or as the program approach and elements are better defined[2].

#### **2.4 Decision Point 3 (DP3) - Approval of production, Phase 3 - *Production and installation***

Based on the results of the industrial prototype, it is envisaged to achieve an operational capacity to meet the needs of the mission.

#### **2.5 Decision Point 4 (DP4) - Approving Changes, Phase 4 - *Operation and support***

Appropriate modifications to the engineering documentation resulting from the previous stages are approved; the operating and support phase throughout the product life cycle is achieved.

Risk management is highlighted in periodic reports:

- the Acquisition Program Basis (RBPA) Report;
- the Executive Procurement Report (REA);
- contract management reports (reporting of supplier cost data, cost / performance ratio, cost / graph status report, contract status report), testing and evaluation reports;
- physical configuration audit;
- functional configuration audit.

Appropriate risk management involves, first of all, the identification of risk, areas and components[7], [12].

### **3. The risk and characteristics of the procurement process**

The procurement process can be characterized by the following concepts that are particularly relevant for risk management in programs.

#### **3.1 Continuous risk management**

The Program Manager should focus on risk management throughout the program, not only during stages 0, 1 and 2, or at decision points. Program risks need to be continually assessed and risk approaches must be developed, executed and monitored throughout the procurement process[1].

The contracting authority and suppliers need to understand the risks as the program advances through the different phases and key decision points and must amend the strategy and the management plan accordingly.

If the risk management processes specific to the contracting authority and the suppliers may be different, it is important for each of the parties to have a set of common and complete steps/stages and to exchange information.

#### **3.2 Stability of the program**

Once the program started, its stability is a top priority.

The keys to creating program stability are the realistic planning of the funds to be allocated and the permissibility assessments. They must reflect the precise and comprehensive understanding of the existing or expected risks of the program.

A risk management strategy needs to be developed at the start of the process, before the program actually starts, to ensure that it is stable, recognizing that key issues affecting the stability of the program may be external.

#### **3.3 Life cycle cost reduction**

Although current practices on program allocations do not determine exactly who is responsible for estimating the cost of some components of Integrated Logistics Support (ILS), it is acceptable for all components of the Army system with tasks related to the

implementation of procurement programs that total cost reductions for acquisition and operation of systems, while maintaining a high level of performance for the beneficiary, is the highest priority. This is reflected, in part, by introducing the concept of « cost as an independent variable (CAIV)». CAIV determines aggressive, realistic cost targets within an acquisition program and then tracks all aspects of the program to achieve those goals, while satisfying the needs and performance of the beneficiary[10],[11].

In the CAIV concept, risks need to be understood, assumed and controlled to achieve cost, timing and performance objectives.

### 3.4 Event-oriented management

Event-driven management requires decision-makers to base significant decision-making events on the life cycle of purchases rather than arbitrary calendar dates. This management process highlights efficient acquisition planning and embodies healthy risk management[9], [10].

Decisions on starting a program must be based on performance demonstration, testing and evaluation, and checking that program risks are well understood and managed. Meeting the agreed exit criteria is an indication that the program manager runs

the risks effectively.

### Conclusions

Prior to a technical milestone or key analysis of the program (*milestone achievement*), the program manager should update the risk assessments by explicitly referring to risks in critical areas such as threat, requirements, technology, etc., and identify areas of moderate or great risk. Each technical assessment (audit) shall be supported by the risk assessments of the subsystems, based on the project analyses, test results and specific analyses.

The Program Manager should present measures to mitigate the planned risks for moderate or high risk areas at each milestone achievement or technical milestone.

Risk management is a sum of activities to be looked at and especially applied in strict interdependence with other project management activities.

In order to be successful in controlling the risks and in particular mitigating their effects in the event of occurrence, it is necessary to apply the risk management at all levels of the organization and from the very moment of drawing up the project plans so that they are clearly highlighted when taking the decisions.

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