The Evolving Relation Between Public Procurement and Industry on Space and Defence Programmes - Strategic Perspectives Towards Respecting Costs and Schedules on Large Contracts

Hall D September 27, 2017
09:30 - 11:30
Opening address

The Hon Christopher Pyne MP
Minister for Defence Industry
Presenters:

Ronald Schwennen – GAO
Andy Cornfield – BAE Systems
Roy Zacharias – Australian DoD
Hiroyuki Kishindo – JAXA
Steve Miller – Lockheed Martin
Vincenzo Giorgio – Thales Alenia Space
Toni Tolker-Nielsen – ESA
Panel members:

Eric Morel de Westgaver – ESA
Andrew Jacopino – Australian DoD
Giuseppe Morsillo – Eurospace
Lisa Callahan – Lockheed Martin
David Bond – BAE Systems
Koji Terada – JAXA
Moderator:
Pieter van Beekhuizen – ESA

Rapporteur:
Karina Miranda Sanchez – ESA
Presenter:
Ronald Schwenn
Assistant Director Acquisition and Sourcing Management
GAO (USA)
Tools to Manage Risk and Reduce Cost and Schedule Growth

Ron Schwenn, Assistant Director
U.S. Government Accountability Office

Global Networking Forum
What is GAO?

• GAO is an independent, nonpartisan agency that is part of the legislative branch of the U.S. government.

• Called the “congressional watchdog,” we investigate how the federal government spends taxpayer dollars.

• Our international counterparts include the Australian National Audit Office, among others.

• Our work covers a wide-range of civilian and military space issues involving both NASA and DOD.
NASA’s cost and schedule performance has recently improved…

…but NASA still faces significant challenges in its human spaceflight development programs.
What factors have led to the improvement?

- More disciplined project management and oversight
- Better cost and schedule estimating tools

★ More funding and time to address risk
★ Higher levels of technology maturity

- Fewer late changes to system designs
NASA has committed to funding projects at higher levels to help manage risk

- NASA requires major projects to develop joint cost and schedule confidence levels.
- NASA requires projects be baselined at the 70 percent confidence level—higher than most DOD space programs.
- GAO has recommended that NASA update confidence levels as projects progress to account for new risks.
NASA projects are maturing key technologies earlier

- NASA has improved the maturity of key technologies before starting projects.
- GAO best practices recommend demonstrating all technologies to a Technology Readiness Level 6 before preliminary design review.
- If a project has immature technologies, the key is to resource the potential risk.
NASA launches OSIRIS-REx early and under budget

- Project was baselined at a high joint confidence level. Schedule was a driver due to the launch window.

- Technical risk was low. Few, new critical technologies. All demonstrated to TRL 6 prior to preliminary design review.

- Project experienced delays and cost overruns with one of its instruments, but had adequate reserves to mitigate any programmatic impact.
Space Launch System will exceed its schedule baseline

• In 2014, GAO found that NASA’s initial cost and schedule targets were unrealistic.

• Program was baselined at a high joint confidence level with limited cost reserves.

• As technical and design risks emerged, NASA did not reassess its reserve posture.

• GAO has recommended NASA reevaluate the date for Exploration Mission-1.
GAO Project Management Tools

GAO has issued three guides for project managers and auditors:

• Cost Estimating and Assessment Guide
• Schedule Assessment Guide
• Technology Readiness Assessment Guide
The estimating journey -
International Astronautical Conference

Andy Cornfield
Chief Financial Officer – BAE Systems Australia

September 2017
Stay involved throughout the lifecycle
Stay involved throughout the lifecycle
Left shift
Stay involved throughout the lifecycle

**Determine** how much your product or service ‘should cost’
Stay involved throughout the lifecycle

Influence - before cost is designed into the product
Stay involved throughout the lifecycle
Refine and re-evaluate estimates throughout lifecycle
Stay involved throughout the lifecycle

**Consider** the Total Cost of Ownership
Understand risks and uncertainty
Understand risks and uncertainty

**Risks** - an event that could occur (impact and probability)
Understand risks and uncertainty

**Uncertainty** - range of possible outcomes
Understand risks and uncertainty
Run **statistical analysis** to understand impact of risks and uncertainties
Understand risks and uncertainty

**Analyze cost and schedule together**
Understand risks and uncertainty
Determine a comfortable balance point on schedule & cost
Modelling of solutions
Modelling of solutions

Parametric Modelling
Modelling of solutions
Operational analysis, and discrete event simulation
Modelling of solutions
Collect and control data
Modelling of solutions

Manage change
Modelling of solutions

Justify your numbers

\[ m = 8 \text{ kg} \]

\[ v = 4 \text{ m/s} \]

\[ E_c = ? \]

\[ 1.4 = 645 \]
Modelling of solutions

Feedback data into new models and estimates
Presenter: Roy Zacharias
Executive Director Financial Investigation Service
DoD (Australia)
Overview

- Understanding the Environment – IACCM/ICCPM
- Evolving Contract
- The Australian Context
- Food for Thought
Understanding the Environment – IACCM/ICCPM

- 25% of Global GDP is delivered through projects
- Estimated 6,151,573 billion (18.4%) annual leakage
- Contract itself not complex – Program/project to deliver outcome determines complexity
- Contract living/dynamic document evolves throughout contract life cycle
- Complex projects do not conform to traditional project management “iron triangle”. Evolving Triangle
- Move away from contract is managing the relationship to relationship is driving the contract
- Systematic risk management – win-win outcome
Need to treat key suppliers as ‘strategic assets’ and not as ‘cost centres’.

- Short term price reduction
- ‘Arms length’ commercial arrangements

“Industry as a FIC”
- Long term, performance based contracts based on a relational approach
- Portfolio approach to engagement and performance management
- Appropriate allocation of commercial risk
- Focus on value creation not price reduction
Evolving Contract

Cost Objective

- Cost Exploration
  - Phase dominated by cost uncertainty driven by performance, usage and schedule risks
  - Uncertainty in true TCO
- Cost Reduction
  - Phase dominated by reducing costs from efficiencies gained from reduced uncertainty
- Cost Containment
  - Phase dominated by increasing cost due to aging effects and obsolescence

Support Costs ($) vs Time

- Year 5
- Year 10
- Year 15

Total Cost of Ownership (TCO)

Changing Payment Mechanism / Basis of Payment over the Product Lifecycle

Important to align Payment Mechanism with the Cost Uncertainty Phase

Product Lifecycle

1. Phase dominated by cost uncertainty driven by performance, usage and schedule risks
2. Phase dominated by reducing costs from efficiencies gained from reduced uncertainty
3. Phase dominated by increasing cost due to aging effects and obsolescence

- Cost reimbursable (e.g. Cost + Fixed Fee)
- Fixed Price inc. Pain-share / Gain-share
- Cost reimbursable (e.g. Cost + Fixed Fee)
Australian Context

- Need to maintain technological advantage
  - Wedgetail
  - JSF

- Integration of Systems
  - AWD
  - Acting as a Fleet Leader
  - First of Class
Food For Thought

- Incentivise Collaboration
  - Dialog between stakeholders from early stages
  - Evolving contacts
    - One size does not fit all
  - New angle to the Triangle
  - Win-Win outcome
Presenter:
Hiroyuki Kishindo
Administrator Contract Management Division
JAXA (Japan)
Procurement System and Respecting Costs and Schedules on JAXA project

GNF session
“The evolving relation between Public Procurement and Industry on Space and Defence programmes”
27 September 2017

Hiroyuki Kishindo
(Japan Aerospace Exploration Agency)
Various types of contract models (1/2)

• Some contract types categorized by purpose of contract
  (i) Sale and Purchase contract
  (ii) Service contract (including manufacturing and supply contract)
  (iii) Consignment contract
  (iv) Research and Development contract

• Roles of JAXA and a contractor are different as the following chart illustrates.

<table>
<thead>
<tr>
<th>Type</th>
<th>JAXA’s role</th>
<th>A Contractor’s role</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>pay the purchase money</td>
<td>transfer a certain real right</td>
</tr>
<tr>
<td>ii</td>
<td>pay remuneration for the outcome of work</td>
<td>complete work</td>
</tr>
<tr>
<td>iii</td>
<td>request a contractor to perform an act</td>
<td>perform an requested act (≠ achieve a desired outcome)</td>
</tr>
<tr>
<td></td>
<td>pay expenses to perform it</td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>request a contractor to design, test and manufacture (JAXA can give technical instruction and guidance)</td>
<td>perform the required work (contribute by using own technologies as a contractor having specialized capabilities)</td>
</tr>
</tbody>
</table>
• General clause in the case of delay in delivery

The Contractor shall pay damages in an amount equal to 6% per year of the period of delay of the Contract Amount.

*(special clause in type (i) Sale and Purchase cont)*

However, if the damages surpass this penalty, JAXA may demand compensation for any damages.

If it becomes impossible to perform, JAXA may demand compensation or may terminate all or any part of the Contract.

The Contractor may make a written request to JAXA for adjournment of the Due Date with detailed reasons.

JAXA shall approve such request when JAXA deems the request is appropriate.
Price type

• Contract types categorized by price
  ✓ Fixed-price contract
  ✓ Estimation contract
    (apply to only Consignment contract and joint research)
  ✓ No form of award fee or incentive payment

  In terms of avoiding cost overruns
  Fixed-Price contract = Estimation contract

  In terms of incentive to reduce cost
  Fixed-Price contract > Estimation contract
Reform of JAXA project management

The goals of this reform are;
(i) to encourage JAXA and industry maximize each ability as equal partner for steady implementation of space projects, and
(ii) to enhance internationally competitiveness of JAXA and industry.

Action ①: Improving activities prior to project phase A (Pre-phase A and Phase A) Activities

Action ②: Redefining the roles and responsibilities of JAXA and Contractor

Action ③: Strengthening of JAXA’s activity to create valuable missions
Presenter:
Steve Miller
Director Government Affairs Liaison
Space Missile Defense & Strategic
Lockheed Martin (USA)
IAC 2017

Steve Miller
Lockheed-Martin Space Systems Company
(recently retired after 23 years with the Office of the Secretary of Defense – Cost Assessment and Program Evaluation [OSD CAPE])

September 27, 2017
Keys to a Successful Program

- Design acquisition strategy using lessons learned from previous programs
- Set realistic expectations grounded by historical data
- Establish partnership between customer and prime contractor; and prime and subcontractors
- Establish shared goals and risks
- Choose, empower and then entrust experienced people for leadership positions
- Enforce transparency and trust
- Constantly monitor execution performance

Studying the data and employing lessons learned from legacy programs at initiation and during execution is key
Keys to Managing Risk

- Understanding that risks are not inherently bad; they are necessary to advance science and national security advantage
- Common understanding and agreement of program risks and their implications
- Risks are commensurate with mission goals and importance
- Data collection systems specifically designed for identifying and managing the risk of the program
- Transparency
- Customer and contractor are both vested in managing risk
- Data analysis tools to recognize issues early
- No fear of bringing bad news

A minimum risk program neither advances science nor provides national security advantage – acquisition strategies that minimize risk provide little in the way of national leadership.
Presenter:
Vincenzo Giorgio
Vice President of Institutional Marketing and Sales
Thales Alenia Space (Europe)
IAC 68th Australia
Session on “Respecting costs and schedules on large space and defense contracts”
Adelaide, September 27, 2017

Vincenzo GIORGIO
Vice President of Institutional Marketing and Sales
Foreword

Risk of cost and schedule deviation from the planned ones is somewhat unavoidable in particular when dealing with:

- prototypes projects
- science projects using front end technologies
- planetary exploration

Actions to minimize those risks shall not be handled in isolation but as part of general company improvements processes.
Content

- **Ambition Boost**, a Thales performance tool based on a common framework and local initiatives to align short and mid-term goals with long-term ambition

- Main tools/methods/processes in place at Thales Alenia Space to reduce/avoid cost overruns and schedule delays

- The ESA Consortium Offer Reform: TAS view
Ambition Boost
IS THE GROUP PERFORMANCE PROGRAMME TO ACHIEVE STRATEGIC VISION

In general terms, before approaching any single project the Ambition Boost tool to verify the positioning of any new program / activity with reference to the priorities of business, as indicated in our Strategic Business Plan.

The dynamics of the Ambition Boost then implies:
- The definition of an action plan
- The setting up of indicators to monitor the progress & results

Focus is given on Competitiveness on 4 priority axes:
- Dream products – to move towards a market-oriented product development, identifying clear market needs matching our capabilities
- Top Class Engineering – to develop best-in-class engineering within Thales Alenia Space by deploying an efficient engineering environment that will optimize processes and provide the right tools to our engineers
- Competitiveness in Procurement – to fully leverage Thales Alenia Space global supply chain while managing supplier performance to meet our customer expectations
How to build a successful Offer and Program

Main tools/methods and processes in place at Thales Alenia Space to reduce/avoid cost overruns and schedule delays

Solidity of the design solution and of the associated planning start with the offer preparation process

- Bid process in place in order to organize the offer before the ITT/RFP is released by customers
- Intra-company meetings and with supply chain to set up the team
- This then allows to ensure a robust design solution, optimize the bid costs and to make the whole offer process more efficient
- Identification of key decision criteria: Hot buttons versus Solution, Strategy to win, Price to win
- Gates established during the offer preparation; Blue Team/Red Team for offer review, validation & check lists; bid Quality Advice
- Coherent and real-time flow check by means of a Bid Data Repository, available to the Management chain
How to build a successful Offer and Program

Main tools/ methods/ and processes in place at Thales Alenia Space to reduce / avoid cost overruns and schedule delays

Risk management

At the time of the offer preparation this is done through risk analysis (potential cost impact; probability factor; factored cost impact, and finally mitigation approach) using internal process on “Risk & Opportunity Instruction for Bids & Projects”.

Risk Tracking & Management during the contract execution, through dedicated MBR (Monthly Business Review) the action plan is then built and maintained with the objective to:

• Define a transparent communication plan to the customer for any major deviation
• Agree with the Customer a shared recovery plan
• Define and follow on of internal recovery actions
The ESA Consortium Offer Reform

- ESA is one of the major Thales Alenia Space customer; a procurement reform process is on going in ESA

- TAS fully supports of the main criteria settled by ESA, i.e.:
  - Early phase A & B1 extended in time and budget
  - Parallel Key TDAs (technologies development) to ensure appropriate TRL
  - Full consortium Offer instead of Best Practices

- Those being seen as fundamental measures to improve program cost & schedule control and simplifying procurement practices

- In terms of : industrial policy towards SME’s and competitiveness, a limitation to the share of a single industrial group is still considered a necessary measure for TAS
Thank You
Presenter:
Toni Tolker-Nielsen
Inspector General
ESA
ESA Review
on Cost Overruns and Schedule Delays
Cost and schedule slippage of ESA Projects

At the 2008 Council at Ministerial level the Director General was encouraged “to put in place methods, processes and tools, to reinforce the Agency’s capabilities to control the cost and planning of ESA projects”

After a thorough review of 30 major projects the 14 generic causes of cost and schedule slippage was established and a set of recommendations to avoid such causes was established in 2010 (the so-called Peter Edwards Report).

A 2016 internal audit identified that the 2010 recommendations were not implemented to a sufficient degree and cost and schedule slippage had not been improved
Causes for cost and schedule slippage of ESA Projects

Avoidable causes of cost and schedule problems link to initial project decision.
The conspiracy of optimism

The biggest cause of cost and schedule slippage is often linked to "wishful thinking", the so-called "conspiracy of optimism"

Industry (in competition)
Study/Project Manager
Programme Manager
Programme Director
Director General
Member States

- Early independent Peer Reviews is an important element against the “conspiracy of optimism”
Areas of improvement

Four areas of improvement presently pursued

Oversight and Reviews

Procurement and Relations with Industry

ESA Team and Corporate Capabilities

Technology Maturation
Actions for improvement per area (1/4)

Topic 1, Oversight and Reviews:

• Deal with the “conspiracy of optimism”
• Reinforce focus on TRL in early reviews
• Reinforcement of Gate Reviews
Actions for improvement per area (2/4)

Topic 2, Procurement and Relations with Industry

• Evolve towards full consortium offer
• Enhance predictability of Launch Service Price
• Critical elements first
Actions for improvement per area (3/4)

Topic 3, ESA Team and Corporate capabilities

• Project Manager community to share Project Manager experiences
• Pursue Project Management Training Courses
• Systematic tracking of schedule and cost evolution
Actions for improvement per area (4/4)

Topic 4, Technology Maturity

• Strengthen the technology maturity processes

• Ensure sufficient funding is allocated to technology in due time

• Strengthen in early reviews the assessment of respective technologies maturity

• Ensure common understanding of TRL
Thank you for your attention
Panel members:

Eric Morel de Westgaver – ESA
Andrew Jacopino – Australian DoD
Giuseppe Morsillo – Eurospace
Lisa Callahan – Lockheed Martin
David Bond – BAE Systems
Koji Terada – JAXA
Panelist:

Eric Morel de Westgaver

Director of Industry, Procurement and Legal Services

ESA
Panelist:

Andrew Jacopino

Assistant Secretary Supplier Analysis & Engagement Branch Commercial Division

DoD (Australia)
Panelist:

Giuseppe Morsillo

Secretary General

Eurospace (Europe)
Panelist:
Lisa Callahan
Vice President and General Manager – Civil Space
Lockheed Martin (USA)
Panelist:
David Bond
Chief Operating Officer
BAE Systems (Australia)
Panelist:

Koji Terada

Director Procurement Department

JAXA (Japan)
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