Obsolescence Worshop

MPTB ESTEC

April 22nd

« Concerns about obsolescences management : the Airbus Safran Launchers overview"

Introduction

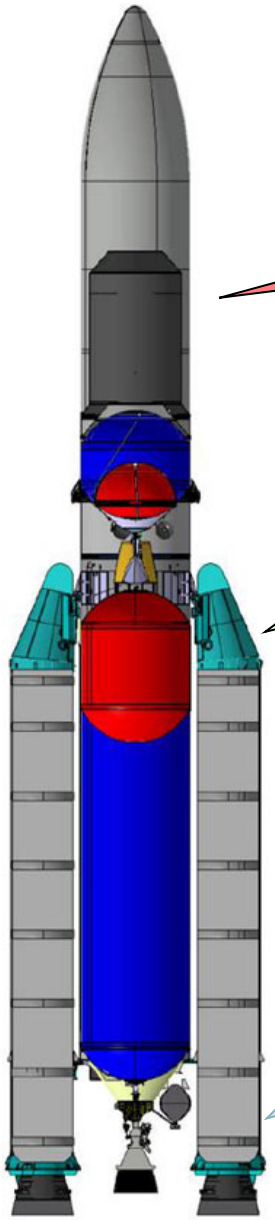
The Environment on Earth and in Space is a concern which becomes more and more important for the space sector.

- Implementation of European directives and regulations such as REACH, RoHS, WEEE, COV, …
- Specific requirements for the space industry :
    - Law on Space Operations
    - The launch-related activities are managed with strict procedures under the CNES control to measure local effects in Kourou to be compliant with the applicable regulations

The space activities have "all the defaults":

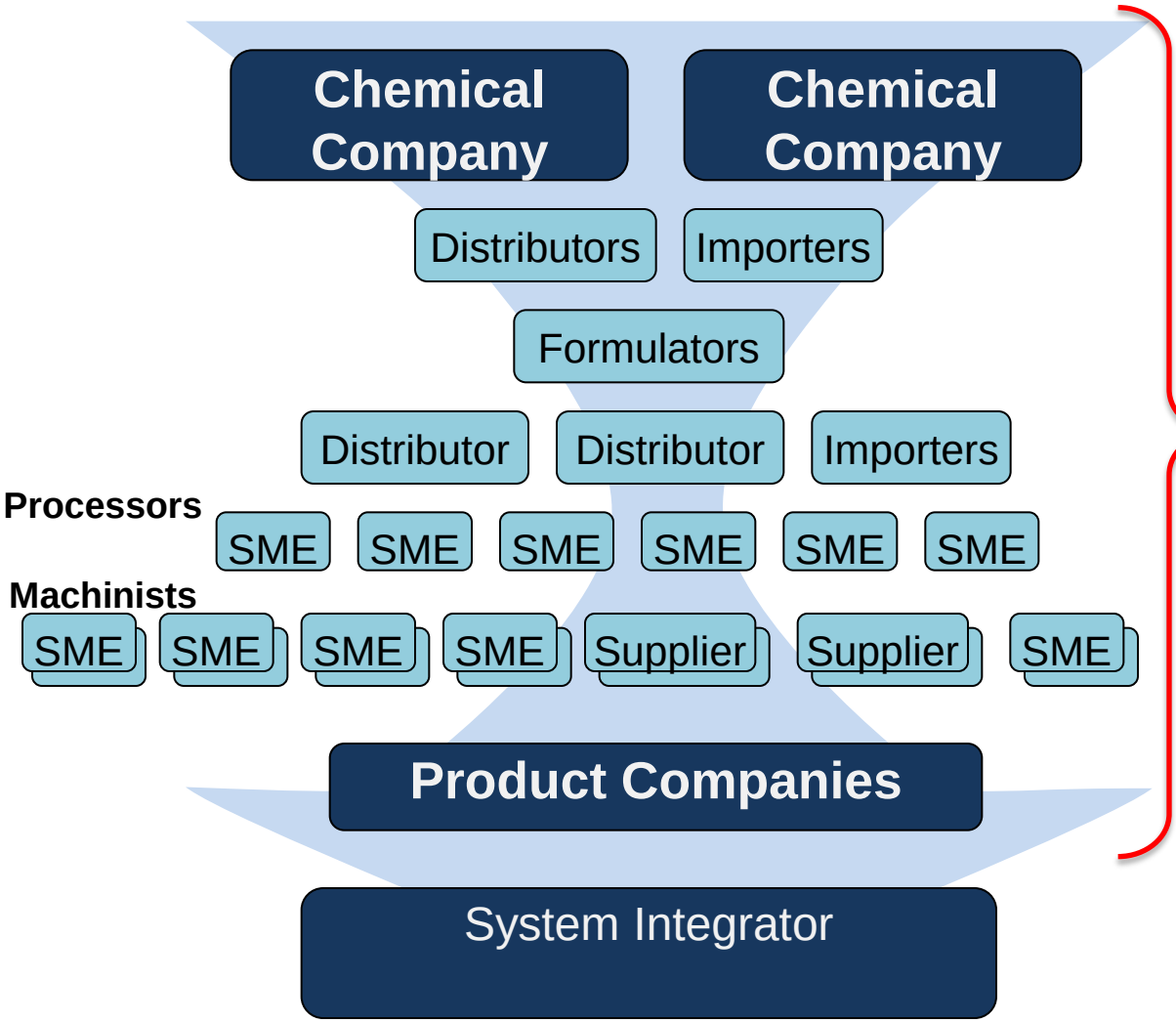
- high level requirements
- low volumes / few units
- depending on SMEs (which can close during the program)
- very long time for system qualification (around 10 years for launchers)

Examples of impacts on launchers



	REACH Candidate List and Annex XIV	other concerns	
Liquid propellants :	• Hydrazine	• MMH ?	Dedicated space uses
Processes :	• Hex. chrome for corrosion resistance • Boric acid for etching, pickling, degreasing	• Nickel salts • Cadmium and cadmium compounds • Cobalt, Lead, Bore	Common use with aeronautic and defence
Substances and formulation :	• MDA = vulcanizer and epoxy precursor (M10) • Formaldehyde • Coal tar pitch	• Beryllium • Acrylonitrile (PAN being precursor for carbon fibers) • Perchlorate is a concern for EFSA • Some substances used in energetic materials	Use partially space specific

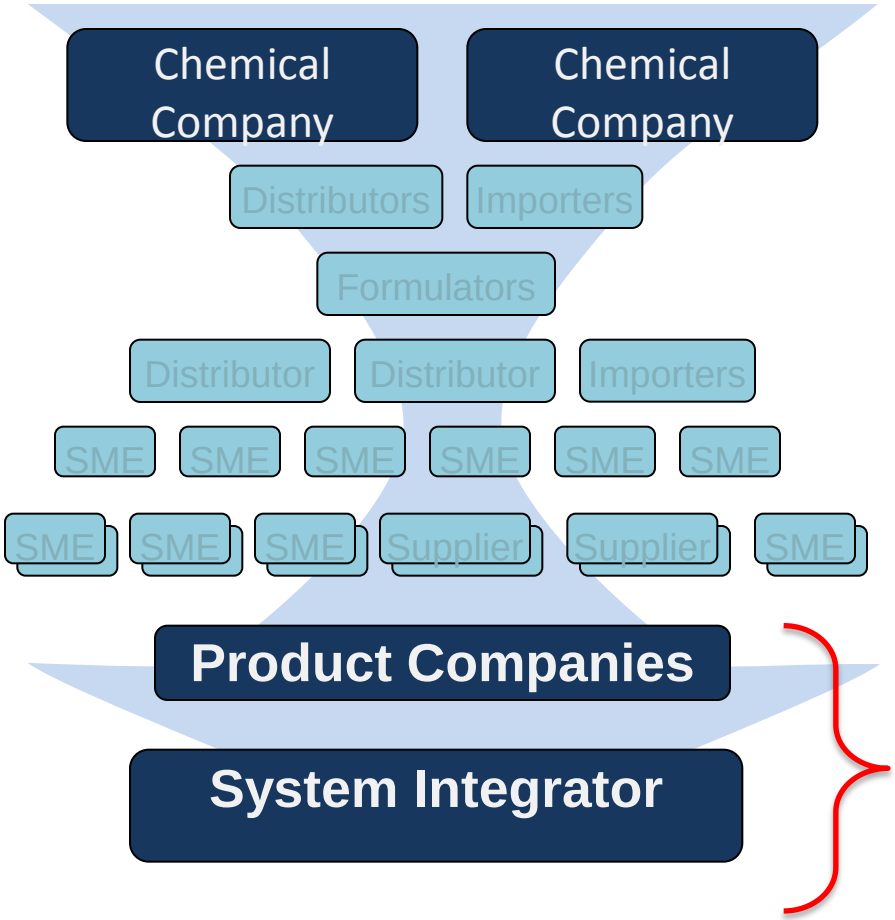
A deep and complex supply-chain (1/2)



The upstream supply chain scheme from chemical companies to product companies

with ASD's courtesy

A deep and complex supply-chain (2/2)



Typical figures for a launcher as Ariane 5 :

- is made of more than 150 000 parts;
- requires 1 500 sub-contractors acting as Tier1;
- those Tier1 have around 500 to 1500 Tier2 suppliers
- the supply-chain is made of 3 to 5 levels:
  - 70% of suppliers are European
  - 30% are outside of EU

New regulations are disturbing the supply-chain

Exchanges between USA and EU are impacted :

- no common worldwide environmental regulation (REACH only in EU)
- for some products, European manufacturers must be compliant with US policy as ITAR or have to select a non US supplier

REACH is:

- a strategic way for manufacturers/importers of substances to streamline their portfolio

  → availability on the EU market : June 2018 will be an important milestone for substances produced at more than 1t/y ("no data / no market");

- a new risk for downstream users who will face to increasing number of obsolescence

  → outsourcing outside of EU could require requalification of main parts ?

- but also an innovation booster …

Design drivers : a constant evolution

1970 | 1980 | > 2015

Feasibility

Europa 2

Performances

Ariane 1

Ariane 2

Ariane 3

Ariane 44L

1° Perf. - 2° Costs

Ariane 5 ES

Ariane 5 ECA

Soyuz

Rockot

Vega

1° Costs - 2° Perf.
3° Environment

A62

A64

the way to tackle obsolescences

The two important steps :

1. to identify the potential obsolescences asap : a long and costly process
2. to treat obsolescences on time: a longer and even more costly process

A general tools for this : the BNAé draft recommendation : "General Principles of Obsolescence Management of chemicals, materials and processes" (RG Aéro 000 78)

Actions to tackle obsolescences – identification of obsolescences

Gathering of obsolescence alerts

- Gathering of all obsolescence alerts coming from manufacturing, procurement, suppliers, network (ASD, MPTB, GIFAS, …)…
- Active and regular consultation of main suppliers
- Active follow up of regulation updates

Analysis of impacts

- For each obsolescence alert, identification of uses specified in the definition and uses during manufacturing process
- Quick state of the art and look for alternatives
- Cost / Planning / Risk estimation of impacts identified above

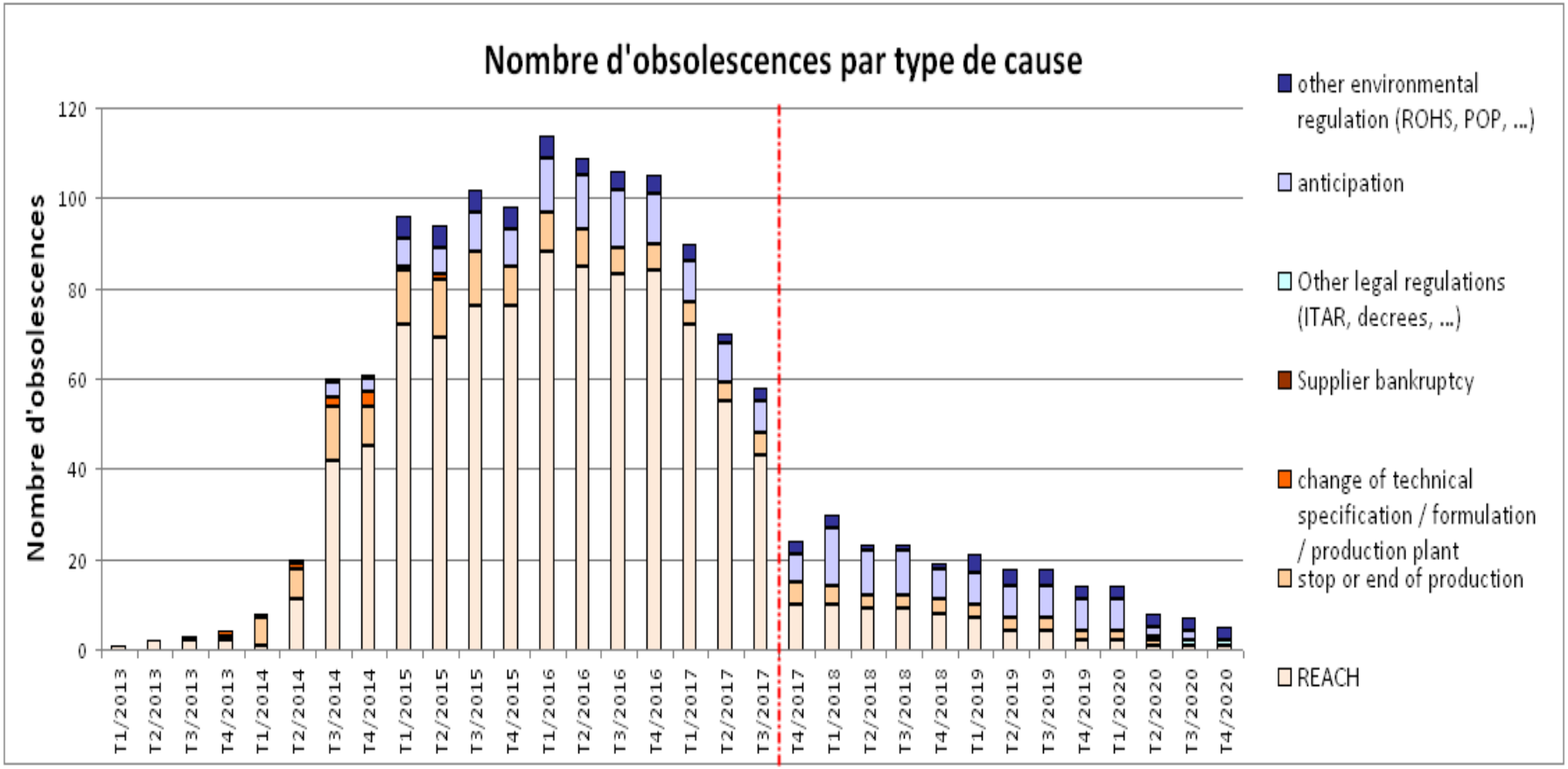
Working Logic

- Look for possibility of strategic storage → none / partly / at completion
- Look for possibility to move toward authorization / derogation / exemption / …
- Look for possibility to go toward qualification of replacement solution

Communication

- Communication to directly involved parties (direct supplier, …)
- Communication to clients
- Communication to third parties → in order to share the alert

a real case



09/2017 = REACh sunset date
for Annex XIV edition 3

Actions to tackle obsolescences – obsolescence treatment

Once the preliminary tasks to identify the obsolescence have been performed :

- Common R&D studies funded by agencies to rise the TRL level for alternatives
- Follow up of technology development proposed on the market
- As a risk management measure in case of long replacement program :
  - Preparation of REACH authorization dossier to be applied for by key actor (through consortia if possible)
  - Establishment of a stock
- Streamlining works required at the launcher level to get funds from agencies (ESA or CNES)

Conclusion

↳a constant survey of the upstream supply chain is required :

- to anticipate potential obsolescences at the soonest
- to launch technical activities in due time
- to mitigate the risk of disrupted supply
- to prepare financial and contractual scheme

AIRBUS SAFRAN LAUNCHERS