

# Practicalities Software development versus Software Maintenance

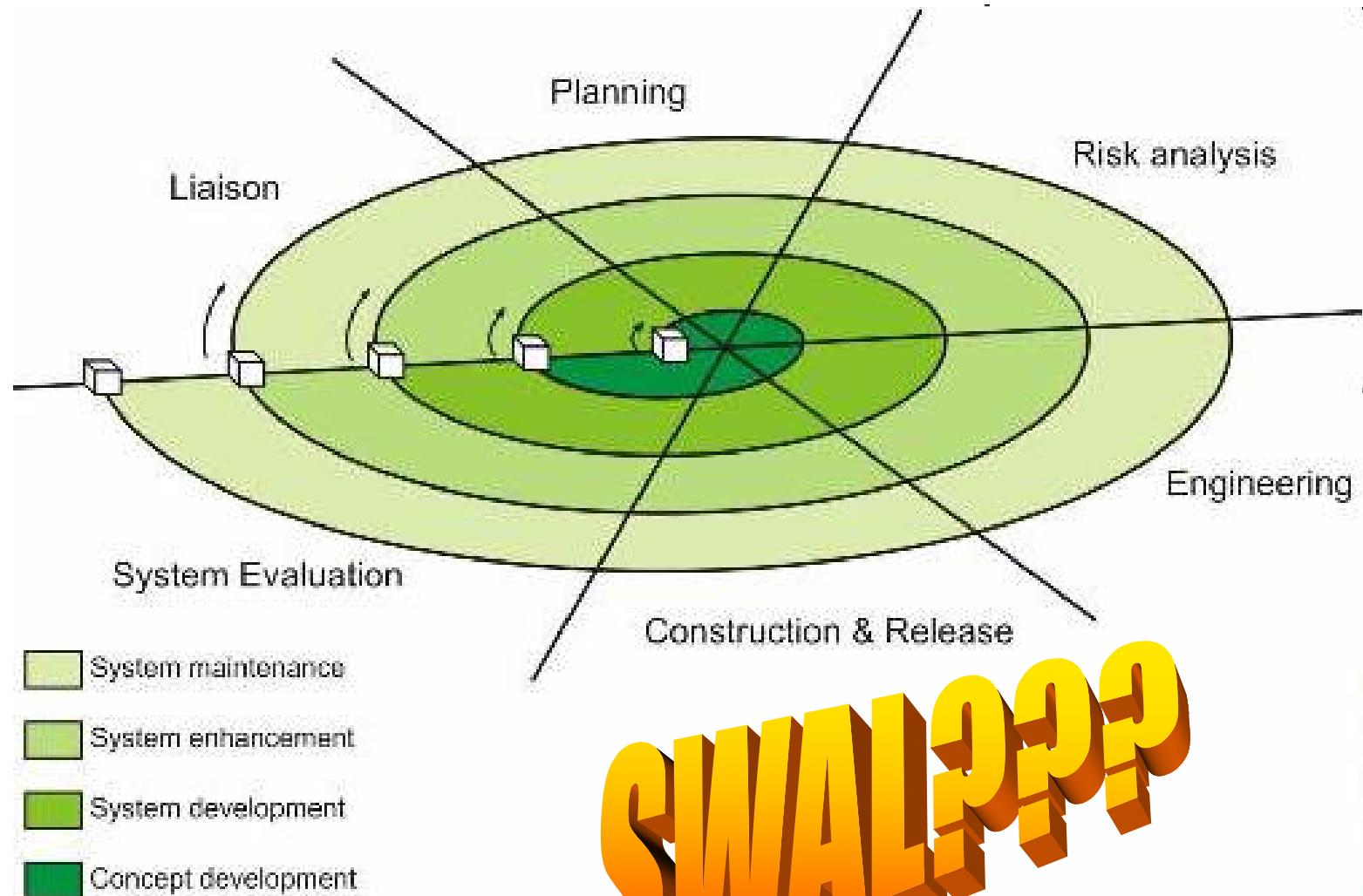
ES2 WS3-2011 Bled/Slovenia - 21/22 September 2011

Software Safety Assurance & Degraded Modes of Operations

# Content

- Software development
- Software maintenance

# Development versus Maintenance



**SWALPPP**

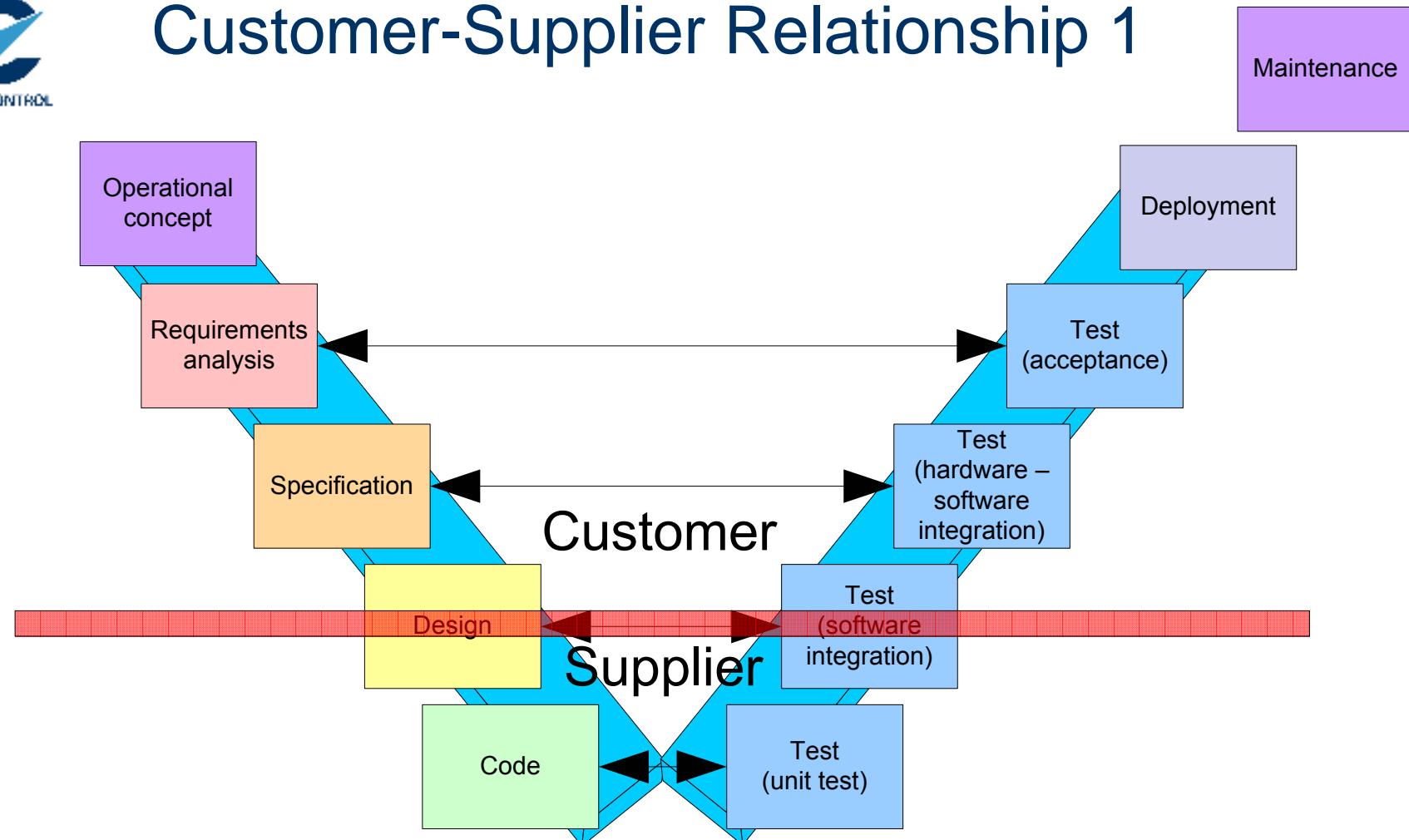
# Content

- **Software development**
- Software maintenance

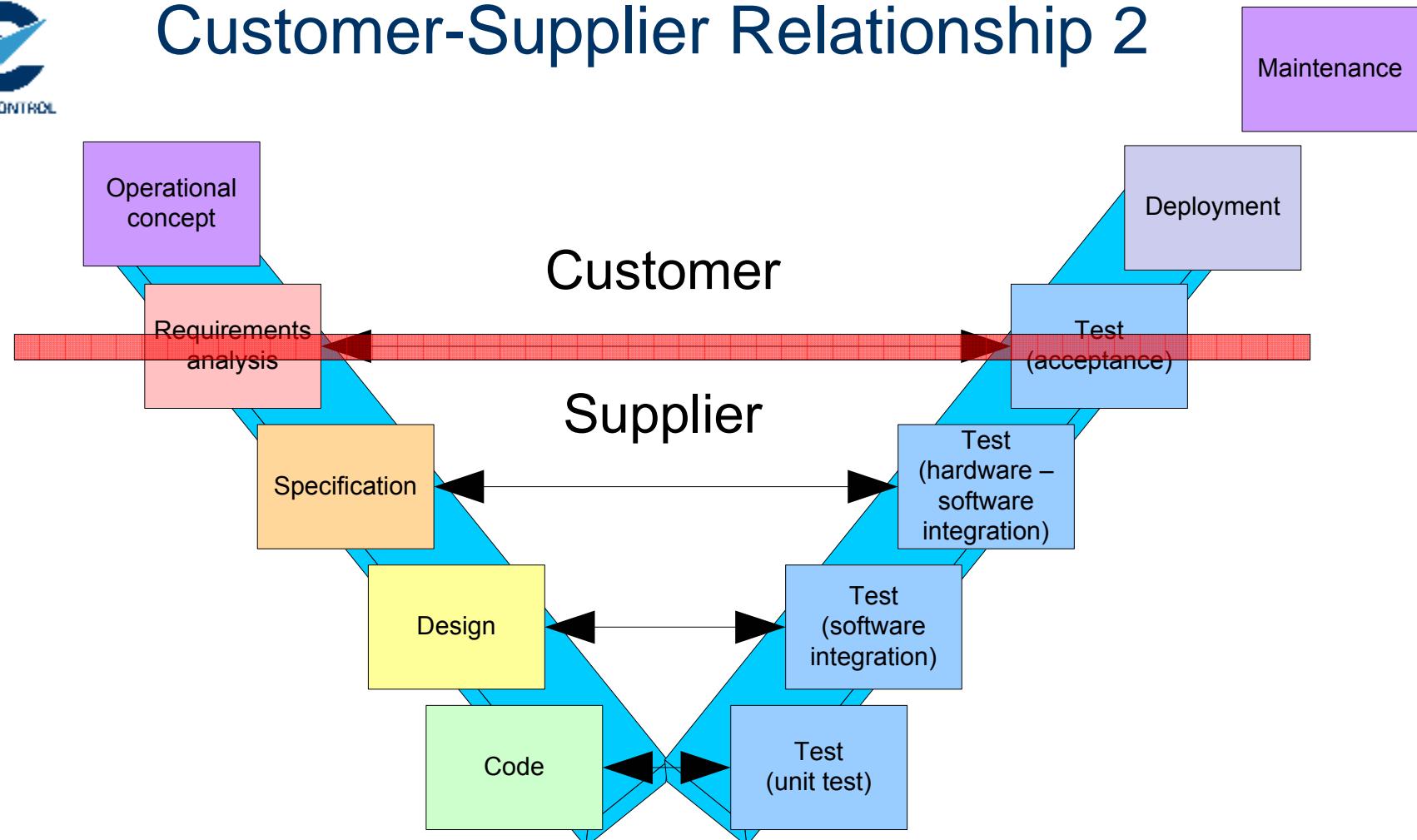
# Procurement Model and Supplier Deliverables

- **Commercial Off The Shelf (COTS)**
  - Glossy brochure
  - User manual
  - In-service data?
  - Test scripts and results?
- **New Development**
  - What ever you can afford!
  - Design, code, test, safety analyses, ...
- **Legacy**
  - Limited by what is historically available

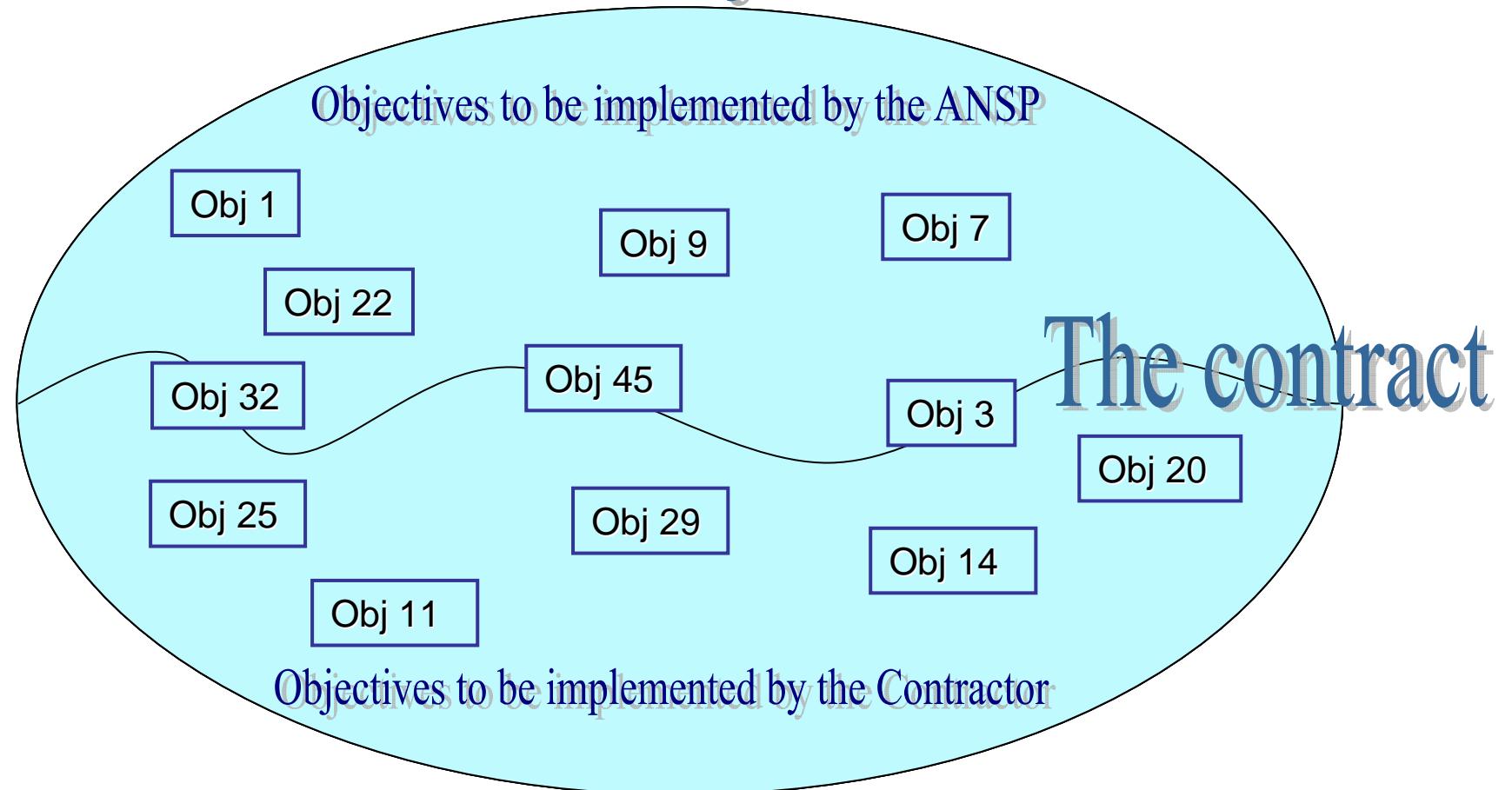
# Customer-Supplier Relationship 1



# Customer-Supplier Relationship 2

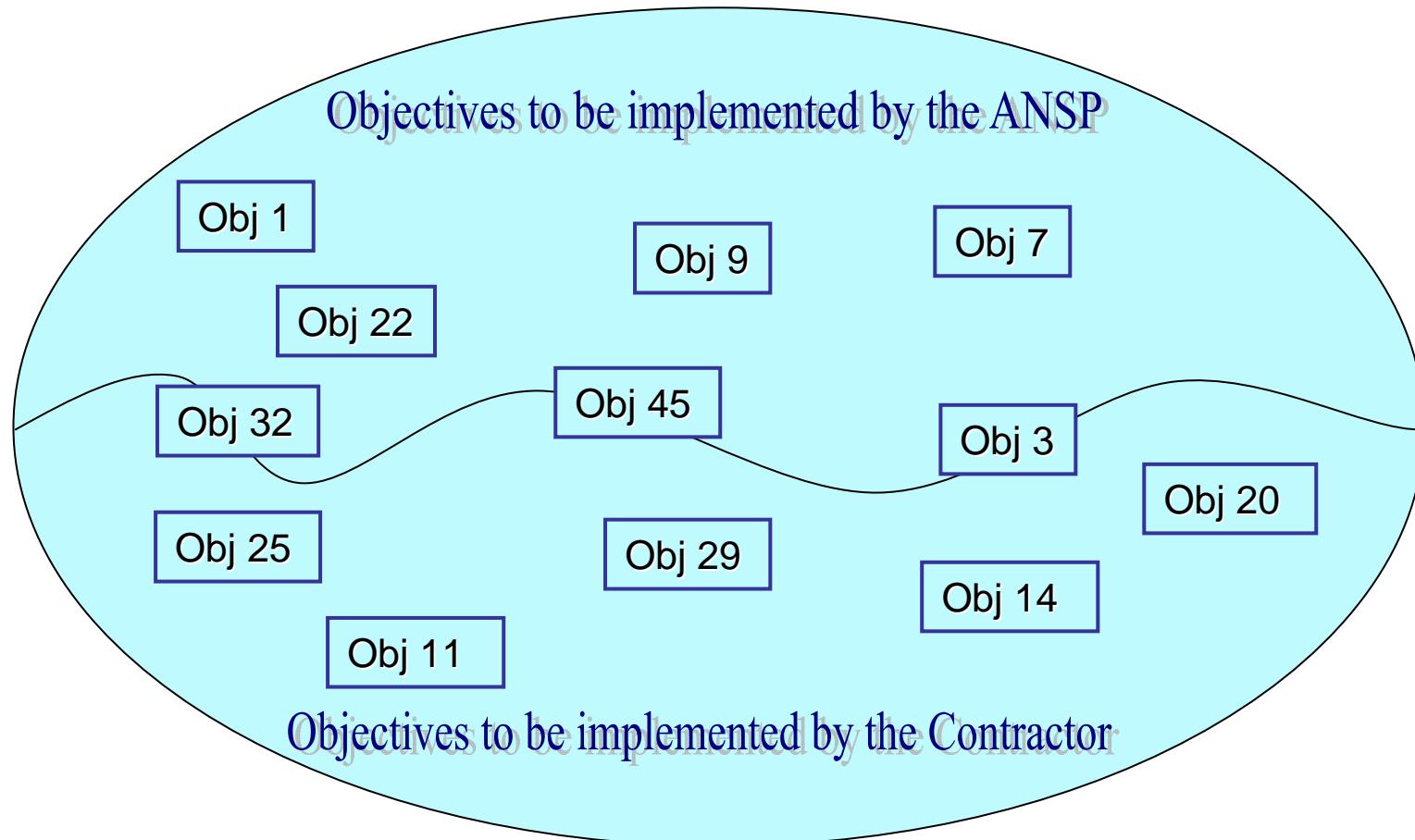


# Who does what? ED-153 Objectives



What if...

# The ANSP develops the software?



## What Safety Assurance might the supplier deliver?

- System Safety Assurance Argument (unlikely)
  - Customer and supplier placed in difficult situation
    - Supplier unlikely to fully understand how the software will be used operationally
- Software Safety Assurance Argument (possible)
  - Customer and supplier need to work collaboratively
- Evidence (likely)
  - Customer left to make safety assurance argument
- Nothing (unlikely)
  - Customer responsible for all Safety Assurance

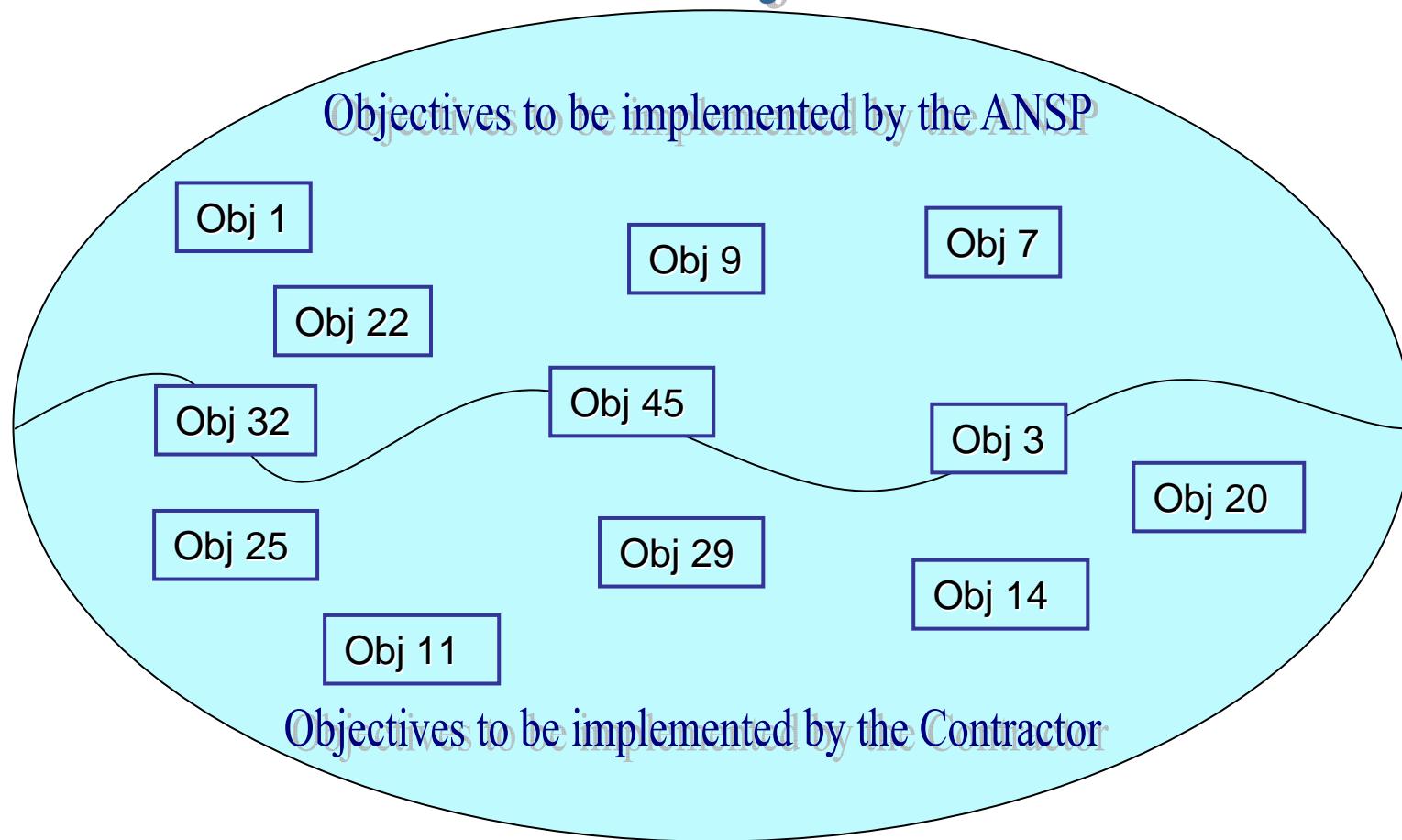
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- Software development
- **Software maintenance**

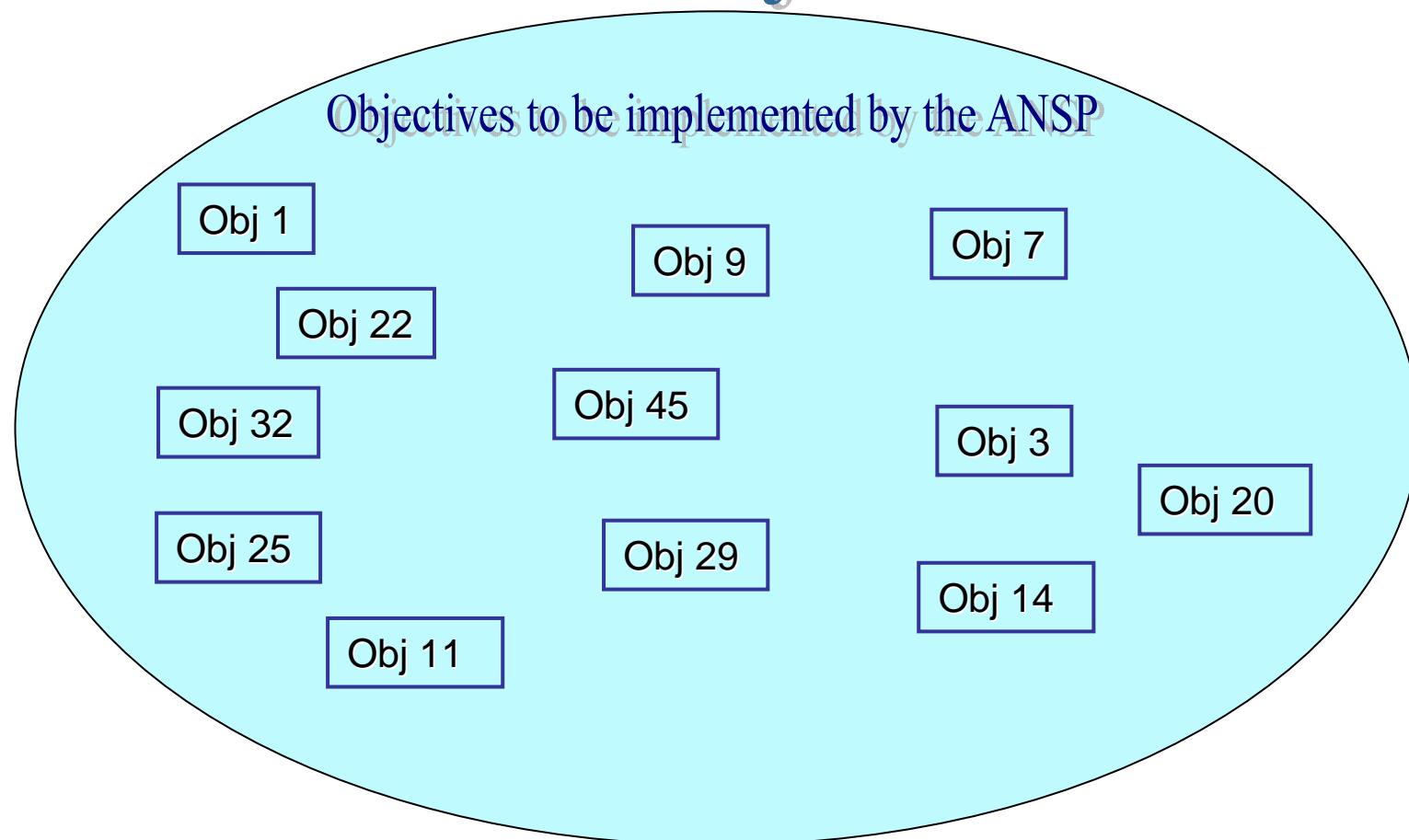
# Maintenance in modern Standards

- No difference between Development & Maintenance
  - Example
    - CMMI always speak about “development and maintenance activities”
  - Maintenance = set of small Developments
- Update adequate part **Safety Case** to demonstrate that Software remains **acceptably Safe**.

# Software Maintenance Case 1: Contractor maintain the Software **ED-153 Objectives**



# Software Maintenance Case 2: ANSP maintains the Software ED-153 Objectives



## Keep in mind

- No matter the Software is contracted or not, the **ANSP is responsible** to demonstrate the Software is **acceptably safe**.
- That applies to software maintenance too.
- Software is and remains acceptably safe during its lifetime.  
This must be demonstrated via the Safety Case.

## Summary

- There are certain deliverables which can be expected from a supplier (And others which cannot)
- It is important to get the right customer-supplier relationship
- It is likely that the ANSP will be left to make safety assurance argument
- There is no real difference between development and maintenance:  
**You must demonstrate the software is and stays acceptably safe!**

# Questions

