Thales Above Water Systems presentation for HBO-I platform

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Contents

- Introduction
  - Combat Management System
  - Above Water Systems

- System & Software engineering

- (AWS Opens System Architecture)
**Sensors & actuators**
- all networked devices
- hard-RT & safety critical
- 4,000 Hz. updates

**Platform**
- full COTS
- 150 processors (embedded + WS)

**Network**
- fault tolerant
- RT + non-RT data
- 100 us. time-align

**Processing**
- automatic (re)allocation
- 2,200 executables
- 6 mln. lines of code

**AWS-CMS**
- fully distributed
- no single-point-of-failure
- self-forming, self-healing

**Combat Management System**
COMPACT SURVEILLANCE SYSTEM - CSS

SEARCH ALTERNATIVES

- SMARTS Mk2
- MRR
- SURICAT
Standard MiRADOR Director, including:
1. TV Track camera
2. TV Color camera
3. IR camera
4. Laser Range Finder

Track Processing Cabinet

Man Aloft Switch

Air Drier

Maintenance Device (IMTS)

Cyber Console

Weapon Interface Node

Ext. System interface
TDS interface
Ship’s Ref. Interface

COMPACT FIRE CONTROL SYSTEM - CFCS

TRACKER ALTERNATIVES

LIROD-Mk2

STING-EO
CMS Functional Model

- **Situation Awareness**
  - Sensor Services
  - Situation Assessment
  - Sensor Control

- **Assessment and Decision**
  - Mission Planning & Control
  - Mission Planning & Control
  - AMOP
  - Situation Awareness
  - Situation Awareness
  - Assessment & Decision

- **Execution**
  - Effector / Asset Services
  - On-board Training, Simulation and Exercise
  - Navigation Support
  - Execution

- **Training & Simulation**
  - Off-board Assets
  - Off-board Assets
  - Platform
  - Effectors

- **Common Services**
  - Logging & Replay
  - Repository Management
  - OSD / ENV
  - System Management

- **Navigation**

Logical grouping subsystems:
- = Logical grouping
- = Functional Area

UNCLASSIFIED
Our Strength & Key Properties

- High system availability
  - Fully distributed architecture
  - Dynamic reallocation of applications
  - Redundancy
- Easy integration with respect to sensors, effectors
- Scalable, fit for small to large ships. Adaptable and expandable with respect to new functionality.
- Independence from hardware platforms
- Cost effective, use COTS products as much as possible
Program characteristics:

- Duration: 3 á 5 years
- Value: 50 á 150 M€
- Technical, Innovative
- Export
- Subcontracting
AWS Program Management: Current major programs

- Germany
  - K130 Corvettes (653DU)
  - F122/F123 Modernization (FAF)
- Greece
  - Fast Attack Crafts (225GR + 249GR)
  - Modernization Combattantes (240GR)
  - Modernization S-frigates (229GR)
- Turkey
  - FPB’s (221TU)
  - IMSS (220TU)
  - MILGEM (235TU)
- Indonesia
  - Corvettes (235RI)
- Japan
  - PAI-system (050JA)
- Spain
  - Ocean + Littoral Patrol Vessels (086VE)
- Denmark
  - Patrol Ships (120DE)
- Oman
  - Corvettes Khareef (078MN)
- Brunei
  - CFCS (025BZ)
- Egypt
  - Fast Missile Attack Crafts (158VS)
Above Water Systems (AWS): Organisation

Key figures: Business Unit: 370 FTEs

BU AWS-NL

Human Resources

Operations

Finance

Marketing & Business Development

Capture & Bids

Program Management

Lead System Integration engineering

Product Center

- SE: 36
- TE: 14

- SE: 35
- SwE: 60
- TE: 30
AWS: Development cycle

- Customer Requirements
- TA’s
- SSS Mission System
- SSDD Mission System
- MS SAT
- MS HAT
- MS System Integration

Product Center

- CMS specification (SSS)
- CMS Design (SSDD)
- Functional Spec (PFS, ICD)
- Software spec. (SRS)
- Functional integration
- Instantiation
- Sw Design (SDD)
- DBT (STP, STR)
- Sw Implem. (SCL)

Product SRR
Product FAT

Combust Management System

CMS-SCIT
HSI
RBT

- product specification
- product description
- product Realisation
- product acceptance
- product integration
System & Software Engineering: Drivers

- Market drivers
  - Shorter time to market
  - Open systems and open to standards
  - Collaborative development with partners

- Business drivers
  - Reduce the costs of system & software engineering
  - Benefit more from “Thales as global company”
  - It must be possible to continue to reuse legacy (evolution rather than revolution)
AWS Engineering roadmap

- **Architecture & Middleware**
  - Modular design, Open Systems strategy
  - Standard Middleware (DDS), Optimal reuse

- **Engineering**
  - Reduction engineering cost
    - Model driven engineering
    - Use standard and integrated engineering environments (Process & Method & Tool sharing)

- **Skills management & Training**
  - Younger and reduced population
  - The right skills for the right jobs: Java, SOA, XML & Web technologies, MDE
Engineering: Complexity vs Productivity

- Model Driven Engineering
- Structured Programming
- Assembly

Productivity vs Complexity and Size
Focus Moves to the Front-End

Requirement Management
Analysis
Design
Realisation
Test & Integration

Now

MDE
Stepwise introduction of new processes, methods, tools to manage costs and risks

process technology engineering environment & tools

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