

Presented by

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Avionics Compt. Smoke Detection System - minimize risk of fires in hidden areas

International Aircraft Systems Fire Protection Working Group
Meeting in Grenoble on June 21-22th, 2004

Minimize risk of fires in hidden areas

Remember:

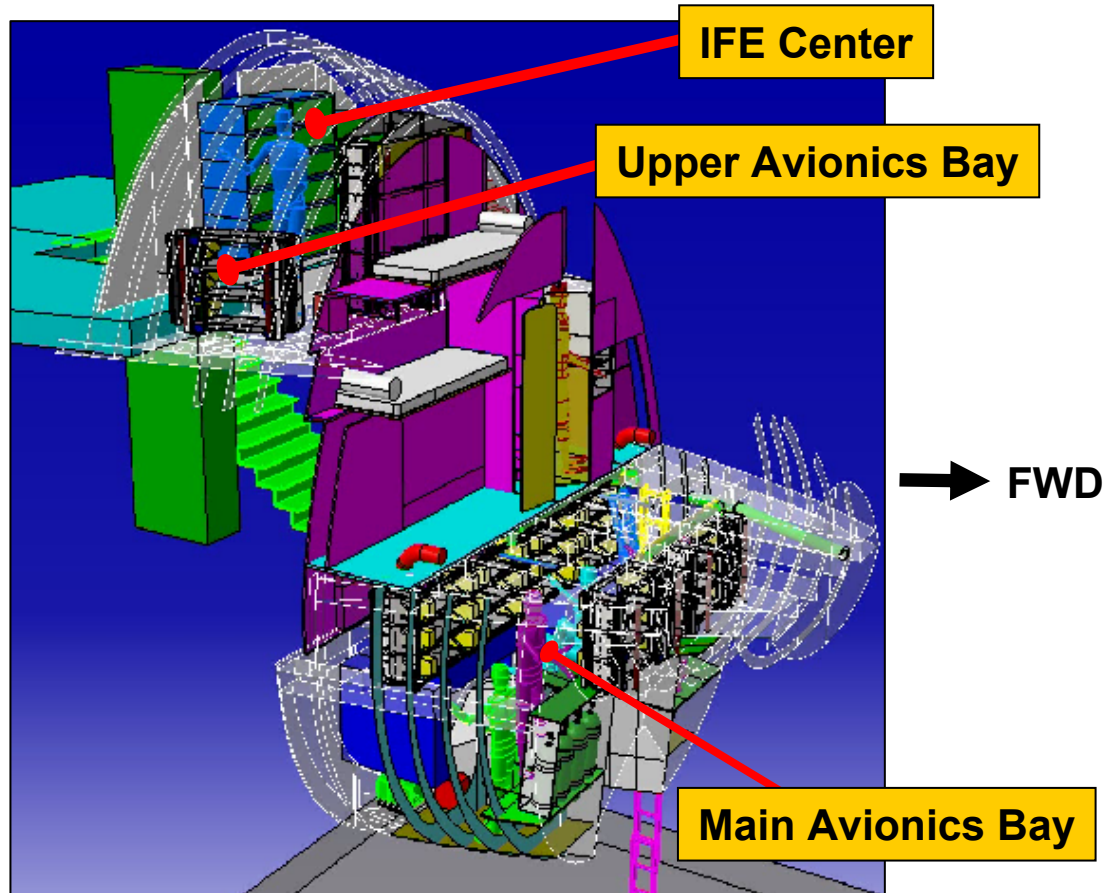
- ▶ Hidden areas maybe
 - on main deck / on lower deck / between decks
 - Above ceilings, behind side panels, below cargo hold floor, dedicated compartments, equipment bays
- ▶ Efficient Fire Protection is an overall approach and requires dedicated to type solutions
 - **Passive** protection (materials & construction)
 - **Active** protection system (detection & extinguishing)
- ▶ **Installation of not required automatic detection systems may additionally support the crew**

Subsystem breakdown

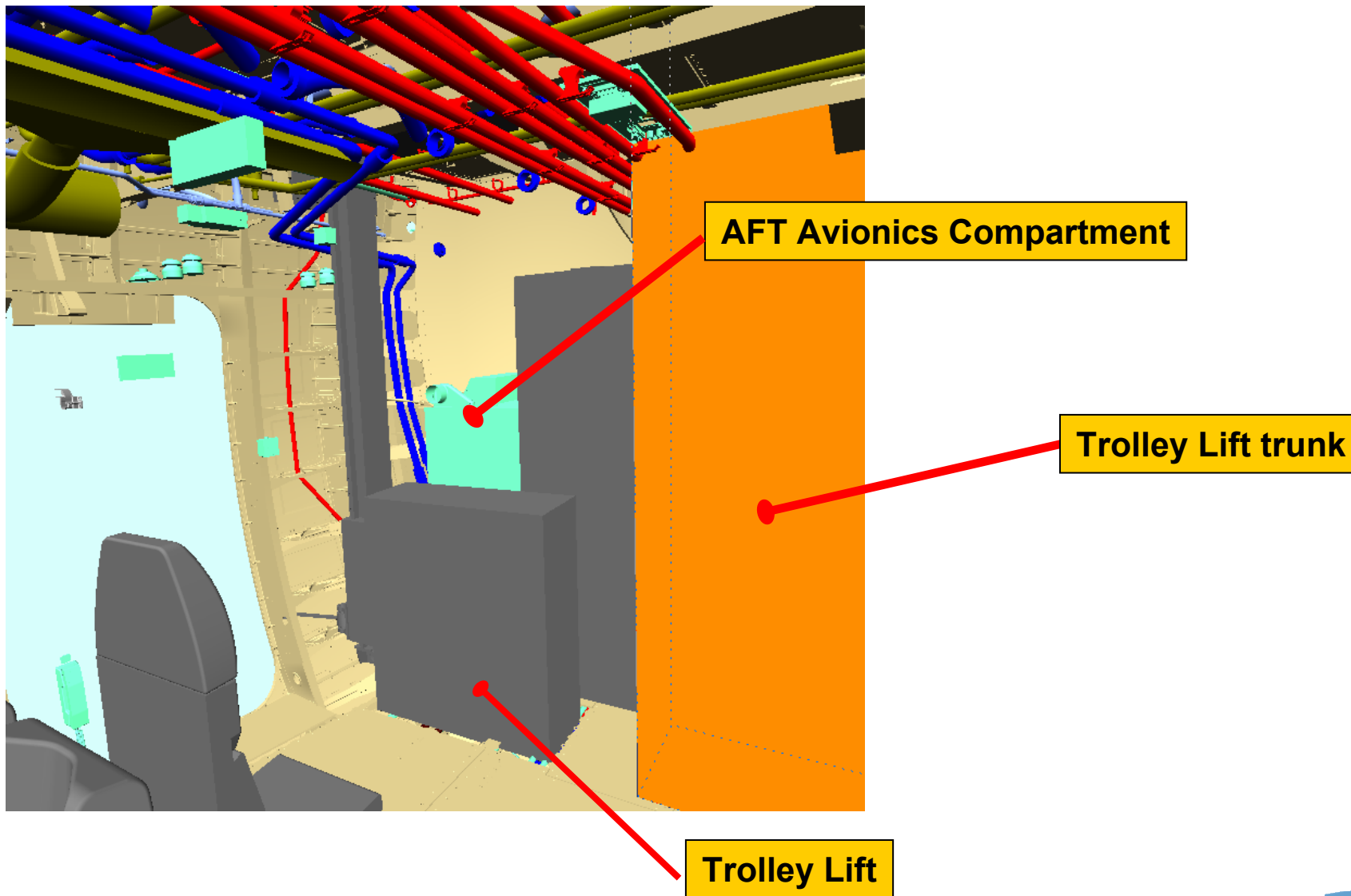
Examples given are based on current A380 design

- Avionics Smoke Detection System
 - ▶ ATA 26-14 Additional Electronics (AFT Avionics)
 - ▶ ATA 26-15 Main, Upper Avionics + IFEC
 - Separation of Main and Upper in LH and RH

Location: Main and Upper Avionics including IFEC



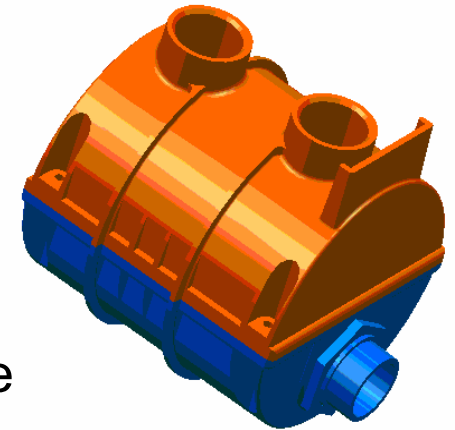
Location: AFT Avionics



Components

- Smoke Detector

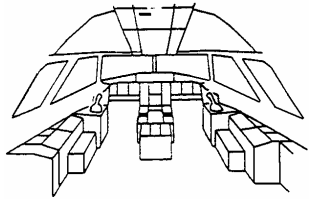
- ▶ Duct-type smoke detector
 - enhanced optical detection principal
- ▶ Interfaces with avionics air extraction ducting
 - classical piccolo tube or equivalent air interface



- Smoke Detection Function (SDF)

- ▶ Hardware and software platform to interface fire/smoke detectors and fire extinguishing system components
- ▶ Communication with cockpit & cabin and other systems

System Architecture

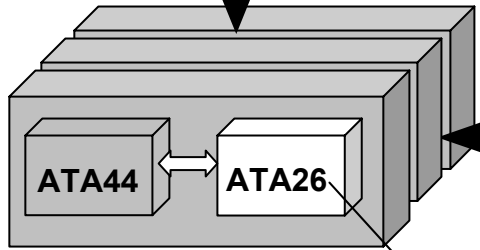


AFDX

- Cockpit (FWS)
- OMS
- other systems

Discrete

- Cockpit indications (ICP09)
- PTT
- Reset



Director 1 & 2 & 3

CAN Bus

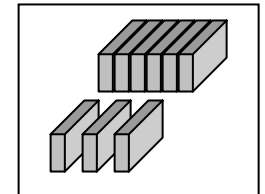
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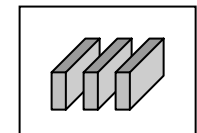
B

A

Upper Avionics + IFEC



Main Avionics



AFT Avionics

Smoke Detection Function is a segregated HW/SW platform which manages essential safety items

SMOKE Warnings (dedicated ducting)

- Smoke Alarm Indications

- ▶ Indication on ECAM (E / WD) (Level 3 warning)

SMOKE L MAIN AVNCS SMOKE

SMOKE R UPPR AVNCS SMOKE

SMOKE AFT AVNCS SMOKE

- Corresponding Fault Indications

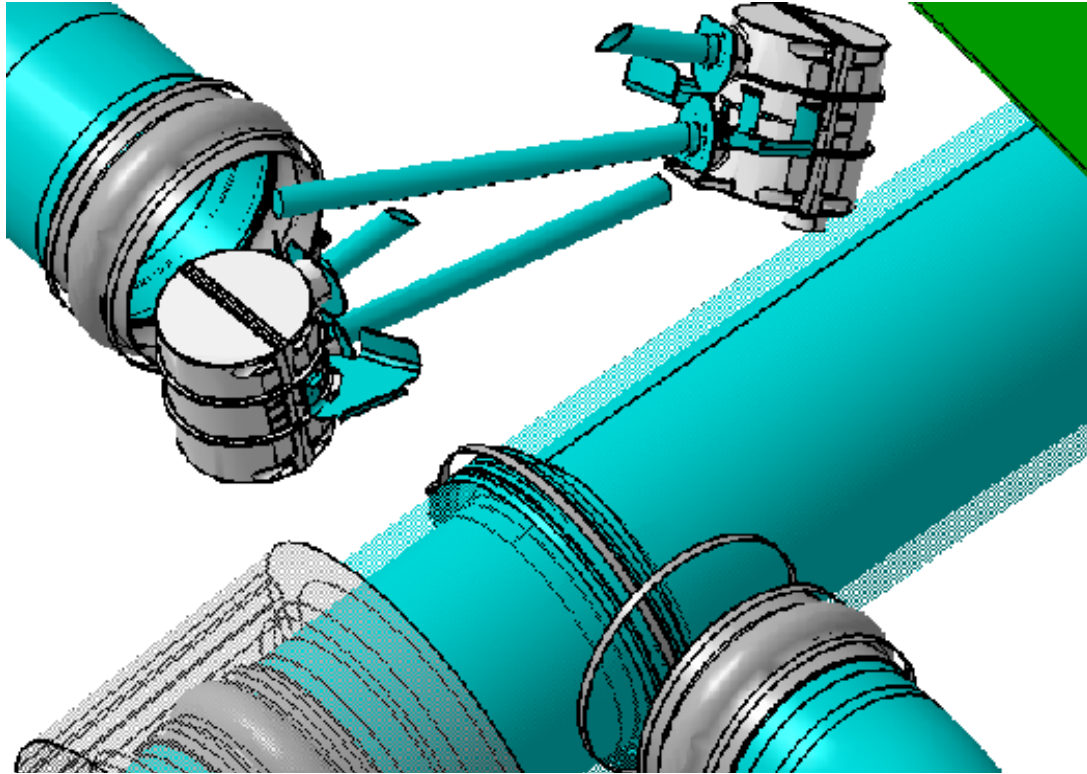
- ▶ Indication on ECAM (E / WD) (Level 1 warning)

SMOKE L MAIN AVNCS DET FAULT

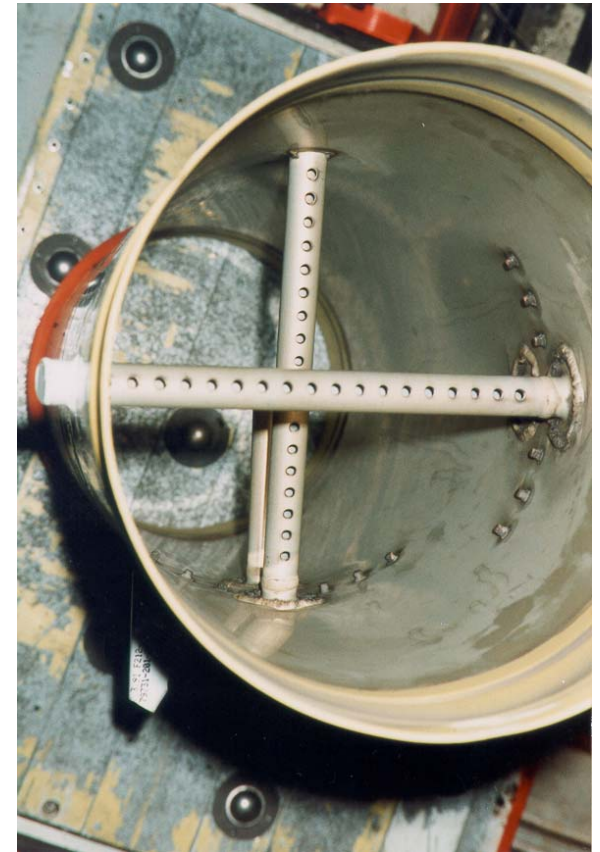
SMOKE R UPPR AVNCS DET FAULT

SMOKE AFT AVNCS DET FAULT

Smoke Detector with Piccolo Tube

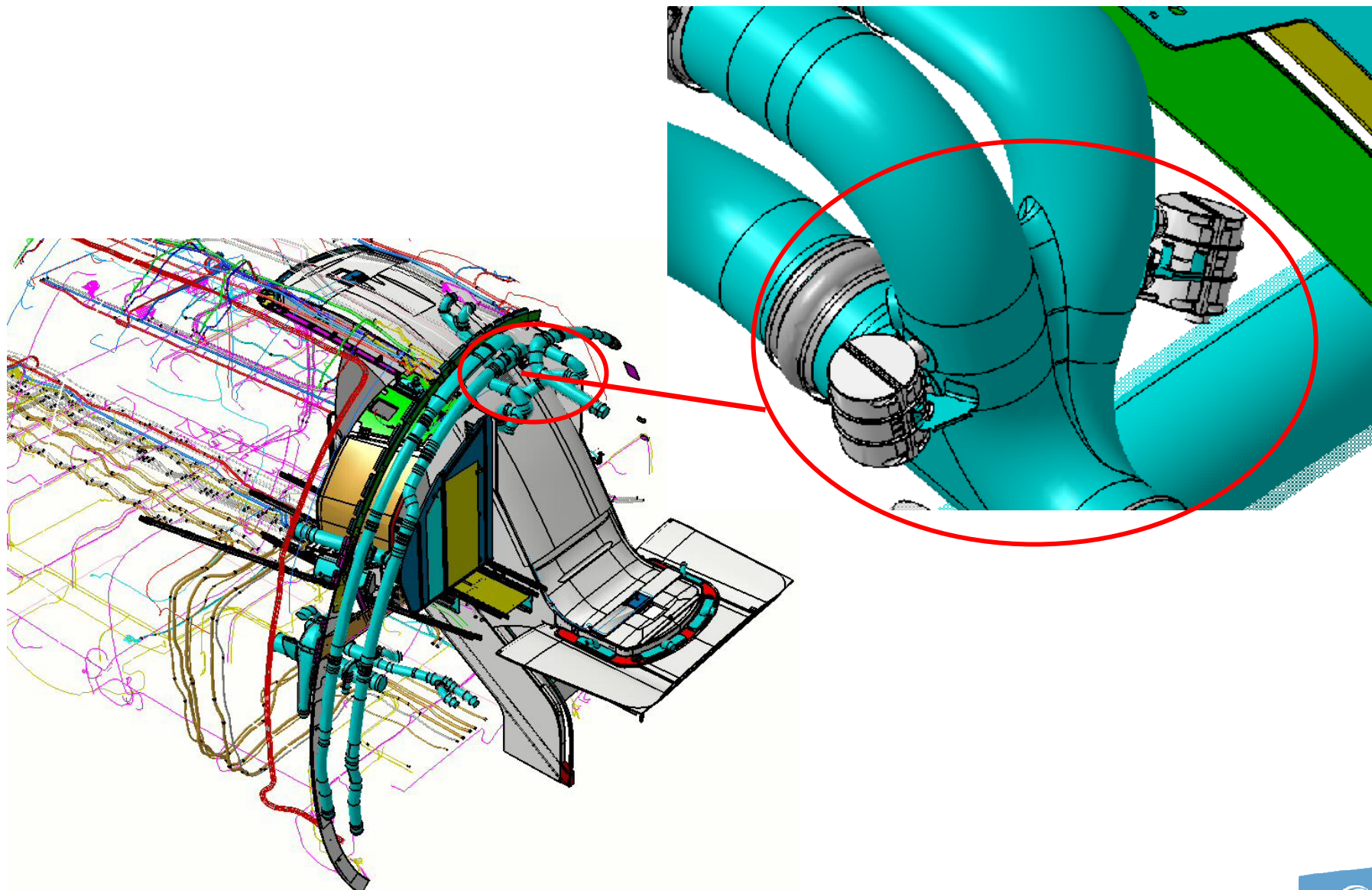


Generic installation with Piccolo Tubes



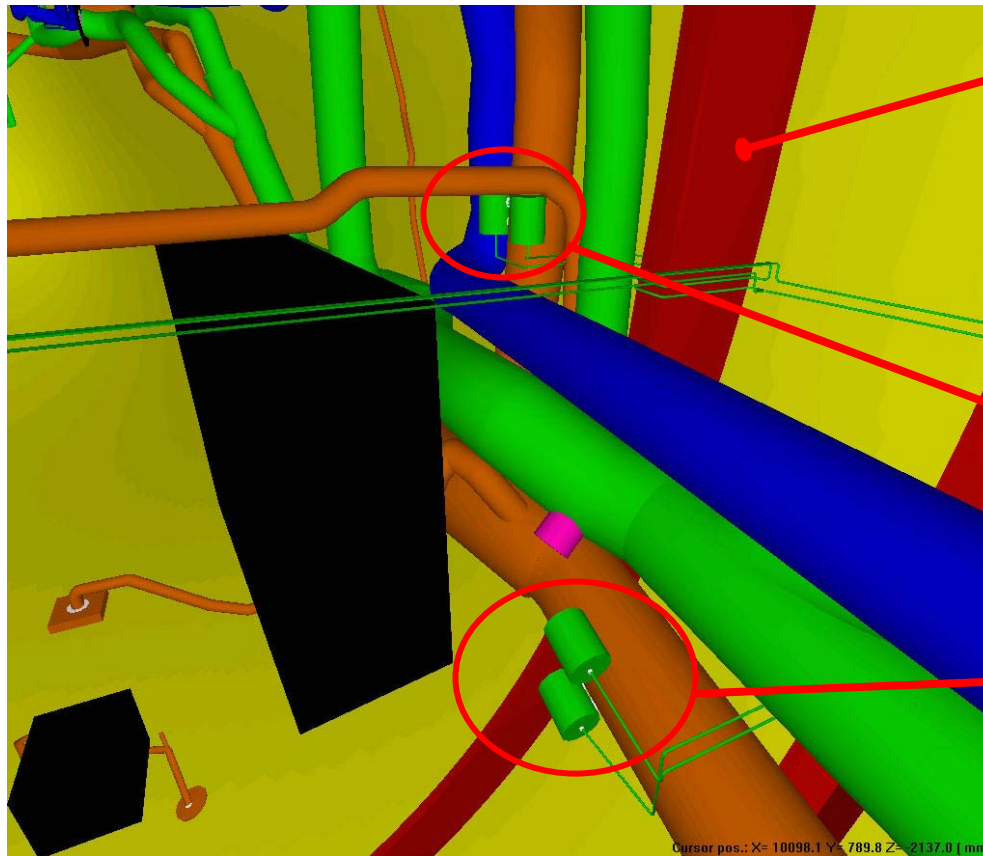
Main Avionics duct (A330 / A340)

Installation IFEC



Installation Main and Upper Avionics

FWD
↑



Frame 17

Detector pair
Upper RH Avionics

Detector pair
Main RH Avionics

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