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# **STAM Safety Assessment: From Design to Live Trials**

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# Overview

1. STAM (Short Term ATFCM Measures): concept overview
2. Safety assessment: OSED level
3. Safety assessment: SPR level
4. Live Trial Safety Case
5. Conclusions & Way forward



# STAM (Short Term ATFCM Measures): concept overview

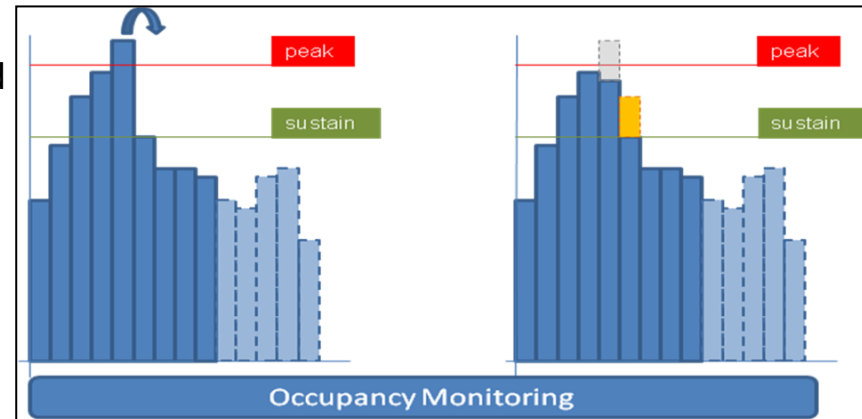
STAM= Fine Tuning technics to adjust imbalances

Tactical ATFCM (day of ops): move from crude ATFCM ground regulations to STAM (based on occupancy counts)

Smooth sector workloads by reducing traffic peaks through short-term application of measures to limited number of flights

STAM Measures:

- Minor ground delays
  - Level cappings
  - Re-routings
- Both on ground and flight execution phases



Ground delay effect on traffic

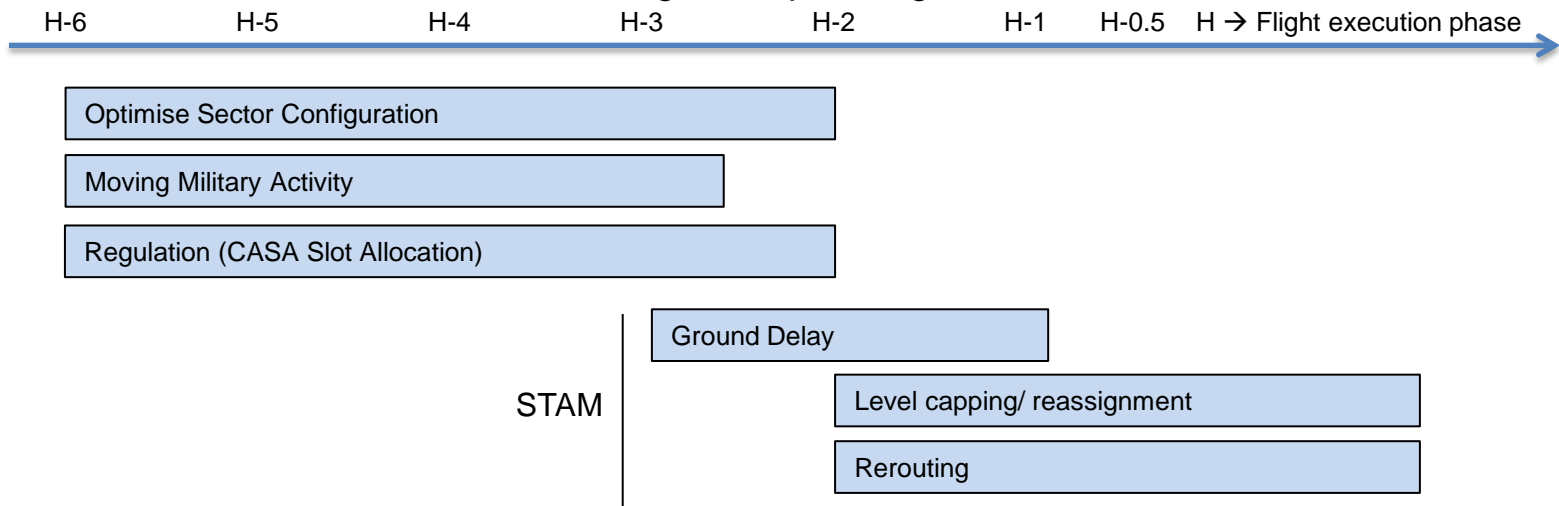


# STAM (Short Term ATFCM Measures): concept overview

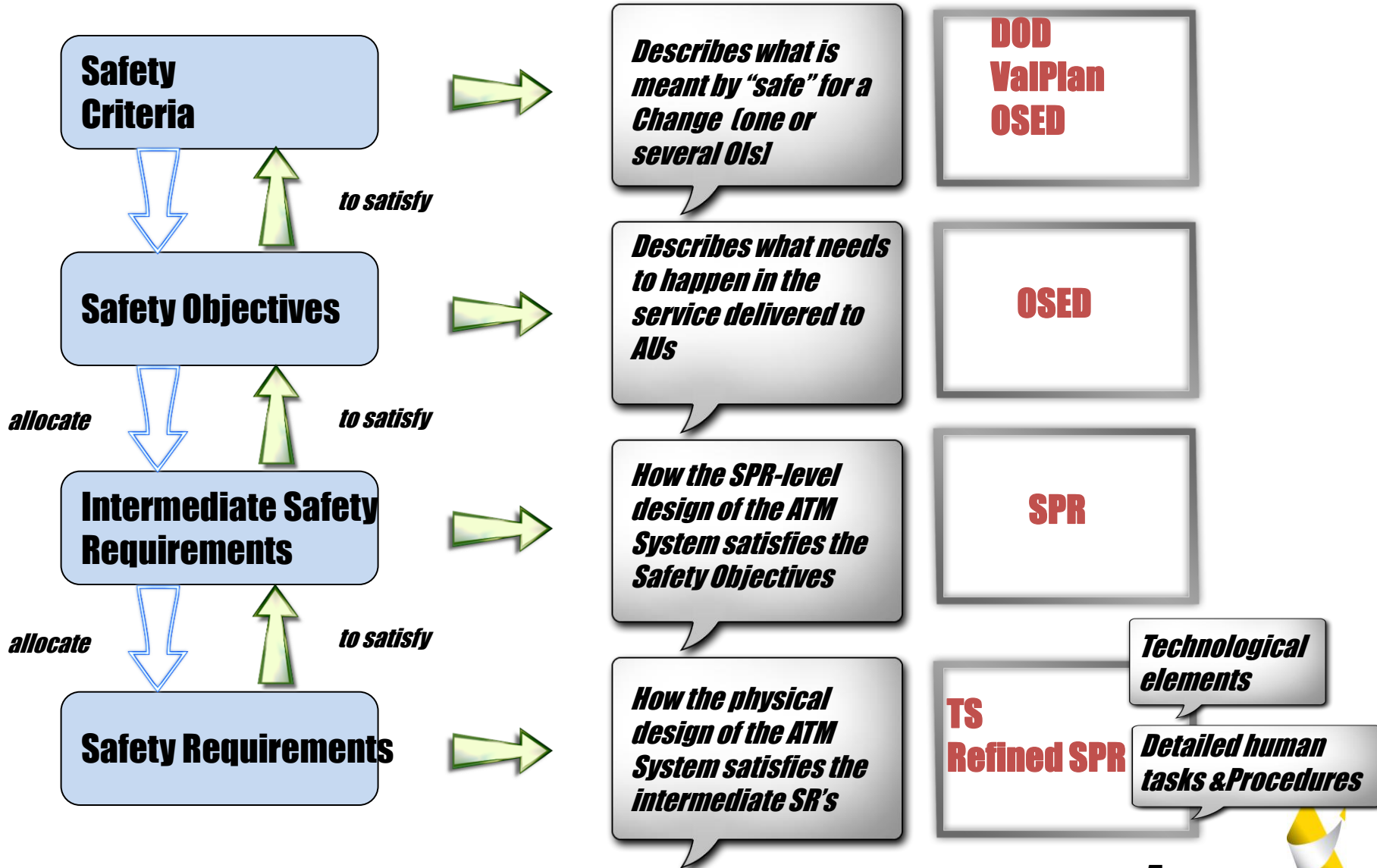
STAM is different from a standard regulation:

1. STAM is applicable to a reduced number of flights.
2. Once STAM decisions are taken locally by ANSPs, they are followed by a coordination process with other actors involved or impacted by the measure (airlines, upstream or downstream ACCs or towers).
3. STAM can be applied when predicted occupancy of traffic volumes is accurate enough for the selection of potential flights (hence short term).

Selection of ATFCM measures according to the planning horizon



# Safety Assessment - SRM



# Safety Assessment- OSED level

SAC: - based on AIM (Accident Incident Model) & feedback from ACC Reims

*With STAM introduction, the number of “planned” conflicts in En Route sectors shall not increase despite the 5% increase in traffic (ER sector capacity) enabled by STAM*

SO Success: - based on OSED & contribution to AIM safety barriers

*e.g. “SO 001: Demand&capacity imbalances shall be detected with sufficient accuracy and sufficiently early to allow design of effective STAM measures”*

SO Failure: -based on HAZID & Risk Classification Scheme

*e.g. Hz 002 “STAM not implemented”*

*<  $1.2 \times 10^{-3}$  per sector ops hour (i.e. less than one every 4 days in an ACC)*

*e.g. Hz 003 “Series of STAM (as alternative to regulation) not implemented”*

*<  $1.2 \times 10^{-4}$  per sector ops hour (i.e. less than one every 40 days in an ACC)*

Validation objectives regarding Safety: - Questionnaires & metrics (potentially)

*e.g. “Q32. I have enough confidence in traffic predictions and STAM measures to accept a higher exploitation of sector capacity whilst maintaining safety level”*



# Safety Assessment- SPR level

Success: Design analysis for completeness & correctness of the S-REQs > missing REQs

# Step	Element (Actor & support)	Action/ Step description & link to OSED requirements	Inputs (source & content)	Outputs (destination & content)	Step ending condition	Next step(s)
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*e.g. REQ: FMP operators shall monitor implementation of STAM (profile changes in real time) and in case hotspot is not solved take appropriate action involving ATC as necessary*

Failure: Causal analysis, risk assessment&mitigation > additional S-REQs to mitigate risk (prevent HZ occurrence)

*e.g. REQ: To display on DCB Toolbox an indication allowing timely detection of temporary loss of input from ETFMS (enabling adequate confidence in the traffic prediction)*

Feed-back from Validation exercises:

*Confirm SAC achievability*

*Modified or new REQs*

Achievability (realism) & testability of new-derived REQs



# Live Trial Safety Case

EXE-07-03-02-VP-522 (Release-4):

- the full STAM Measures concept element defined by Project 13.02.03
- to bring the STAM concept to V3 maturity level (formalised and standard workflow process for STAM, using DCB Toolbox prototype)

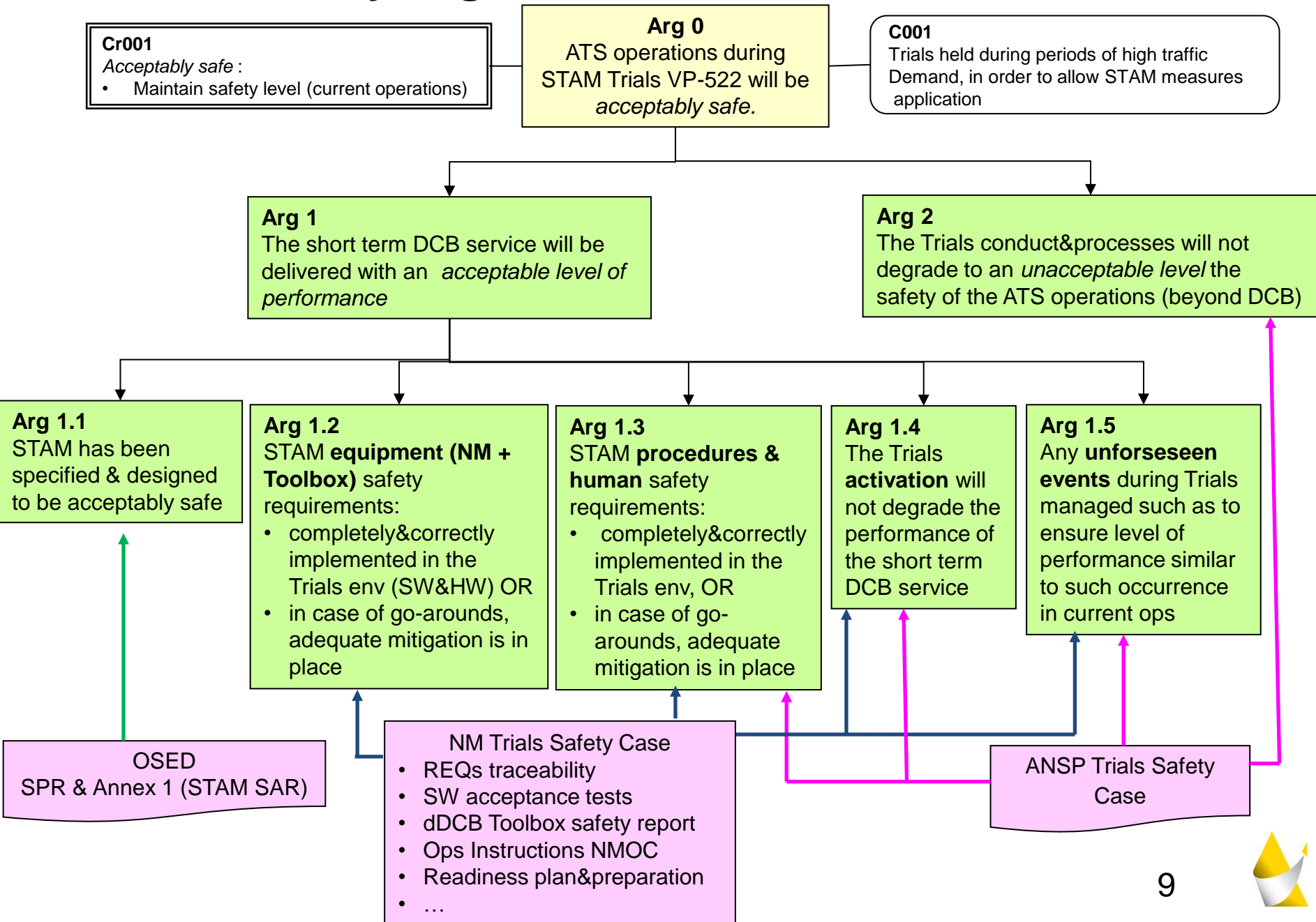
Held October 2014, with participation:

- ANSPs :
  - DSNA (Reims, Brest)
  - NATS
  - ENAV
  - ECTL (MUAC)
  - SkyGuide
  - DFS
- NM
- Airlines: AFR, AZA, BER, DLH, EZY, HOP, KLM, SAS, UAE





# Outline Safety Argument



# Conclusions & Way forward

Safety assurance along the life cycle (Design to Live Trials) (V1 to V3)

VP-522 Trial outcomes fed-back to OSED, SPR

New validation exercises within Step 1:

- VP-700: "Advanced STAM& Interface with Local tools"
- VP-749: "STAM enhanced with Target Time Management and AOP-NOP integration"

