A-SMGCS Routing Workshop Brussels

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CONTENT – FOCUSES ON A-SMGCS SPECIFICATION

- Current Status of A-SMGCS Services Specification

- Overview of the A-SMGCS Services Specification

- A-SMGCS Actors and Responsibilities

- EUROCAE MASPS ED-87

- Summary of relevant documentation

- A-SMGCS - Airport Safety Support Service

- A-SMGCS - Routing Service

A-SMGCS SPECIFICATION -NO. 171

EUROCONTROL Specification
for Advanced-Surface Movement Guidance
and Control System (A-SMGCS) Services

Edition: 1.0
Edition date: 01/03/2018
Reference nr: EUROCONTROL-SPEC-171

- Initial meeting 08.-10.12.2014

- April 2015 First task force meeting

- ANSPs, Airports, Industry, EUROCONTROL

- Between April 2015 and March 2017 six TF-meetings

- **Specification V1.0 published 01 March 2018**

- *Update V1.0 Corrigendum on-going due May 2019*

- *Update V2.0 planned Q2 2020*

OVERVIEW OF THE A-SMGCS SERVICES SPECIFICATION (1)

- Executive Summary

- Chapter 1. Introduction (History, Scope, Definitions Abbreviations etc.)

- Chapter 2 – A-SMGCS Actors and Responsibilities.

- **Chapter 3 – A-SMGCS Services.**

    - **Surveillance Service**

    - **Airport Safety Support Service**

    - **Routing Service**

    - **Guidance Service**

OVERVIEW OF THE A-SMGCS SERVICES SPECIFICATION (2)

- Chapter 4 – Operational Procedures.

- Chapter 5 – System Overview.

- **Chapter 6 – A-SMGCS Requirements.**

- Annexes – Explain the Alerts in more detail.

CONVENTIONS

EUROCONTROL Specifications are *voluntary in status*; however, drafting conventions include 'normative' language to indicate which section 6 requirements must be complied with in order to claim compliance with the specification.

The following drafting conventions are used:

Shall – indicates a requirement which is mandatory or necessary to provide conformity with this specification.

Should – indicates a requirement which is recommended.

May – indicates a requirement which is optional or permitted.

Note: The words shall/should/may in sections other than section 6 are used for narrative purposes and are not describing requirements.

SUMMARY OF RELEVANT DOCUMENTATION
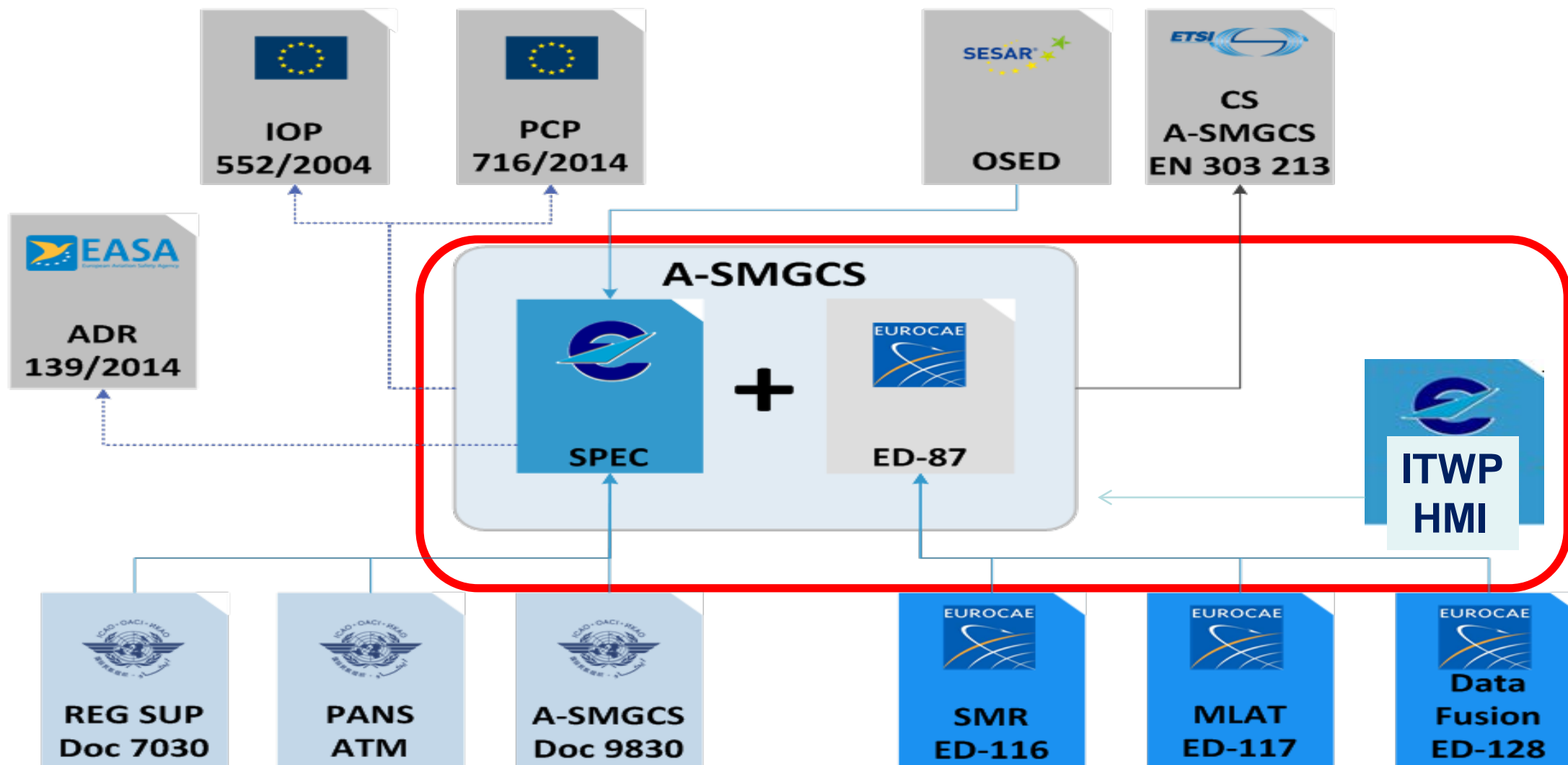
AIRPORT SAFETY SUPPORT SERVICE

- **Runway Monitoring and Conflict Alerting (RMCA).**
- **Conflicting ATC Clearances (CATC).**
- **Conformance Monitoring Alerts for Controllers (CMAC).**

The Airport Safety Support Service may be **partially introduced** depending on local requirements e.g. not all CATC or CMAC alerts may be suitable depending on the aerodrome layout.

The RMCA function acts as a short term alerting tool, whereas the CATC and CMAC serve to be more **predictive** tools that aim at preventing situations where an RMCA alert may be triggered.

For the CATC and CMAC alerts to function correctly it is important that the system receives the Controller's Clearances, therefore, the **Controller must be provided with an Electronic Clearance Input (ECI)** means e.g. Electronic Flight Strips (EFS).

Some of the CMAC alerts work on the assumption that every mobile entering the Runway Protected Area (RPA) or Restricted Area must have received a Clearance from the Controller.

AIRPORT SAFETY SUPPORT SERVICE -FUNCTIONS

EUROCONTROL

R = Routing Service Required

RMCA
Runway Monitoring and Conflict Alerting. (aka RIMS or Level 2)

CONFLICT

CONFLICT
(red)

CATC
Conflicting ATC Clearances

LINE-UP	LINE-UP, CROSS, ENTER, TAKE-OFF, LAND
CROSS or ENTER	LINE-UP, CROSS, ENTER, TAKE-OFF, LAND
TAKE-OFF	LINE-UP, CROSS, ENTER, TAKE-OFF, LAND
LAND	LINE-UP, CROSS, ENTER, TAKE-OFF, LAND

CMAC
Conformance Monitoring Alerts for Controllers

Alert	
ROUTE DEVIATION	R
NO PUSH / NO TAXI APPROVAL	R
STATIONARY	
NO CONTACT	
NO TRANSFER	
NO TAKE-OFF CLEARANCE	
NO LANDING CLEARANCE	
LANDING ON THE WRONG RUNWAY	
LINING-UP ON THE WRONG RUNWAY	
RUNWAY TYPE	
TAXIWAY TYPE	R
RUNWAY CLOSED	
TAXIWAY CLOSED	R
HIGH SPEED	

| (red)	R
ROUTE DEVIATION	R
STATIONARY	
NO TAKE-OFF CLEARANCE	
NO LANDING CLEARANCE	
LANDING ON THE WRONG RUNWAY	
RED STOP BAR CROSSED	
LINING-UP ON THE WRONG RUNWAY	
RUNWAY INCURSION	
RUNWAY TYPE	
TAXIWAY TYPE	
RUNWAY CLOSED	
TAXIWAY CLOSED	
RESTRICTED AREA INCURSION	
HIGH SPEED	

STAGES OF ALERT

Based on the experience and practices of current A-SMGCS in operation in Europe, two stages of alert have been defined as follows:

- **Stage 1 alert** is an <mark>INFORMATION</mark> alert. It is used to inform the Controller of a potential hazardous situation. According to the situation, the Controller receiving a Stage 1 alert may take a specific action to resolve the situation.
- **Stage 2 alert** is an <mark>ALARM</mark> alert. It is used to inform the Controller that a critical situation is developing requiring immediate action.

Depending on the detected situation, alerts may be triggered as follows:

- Only a Stage 1 alert.
- A Stage 2 alert may follow a Stage 1 alert if the potentially hazardous situation becomes critical.
- Only a Stage 2 alert.

STAGES OF ALERT
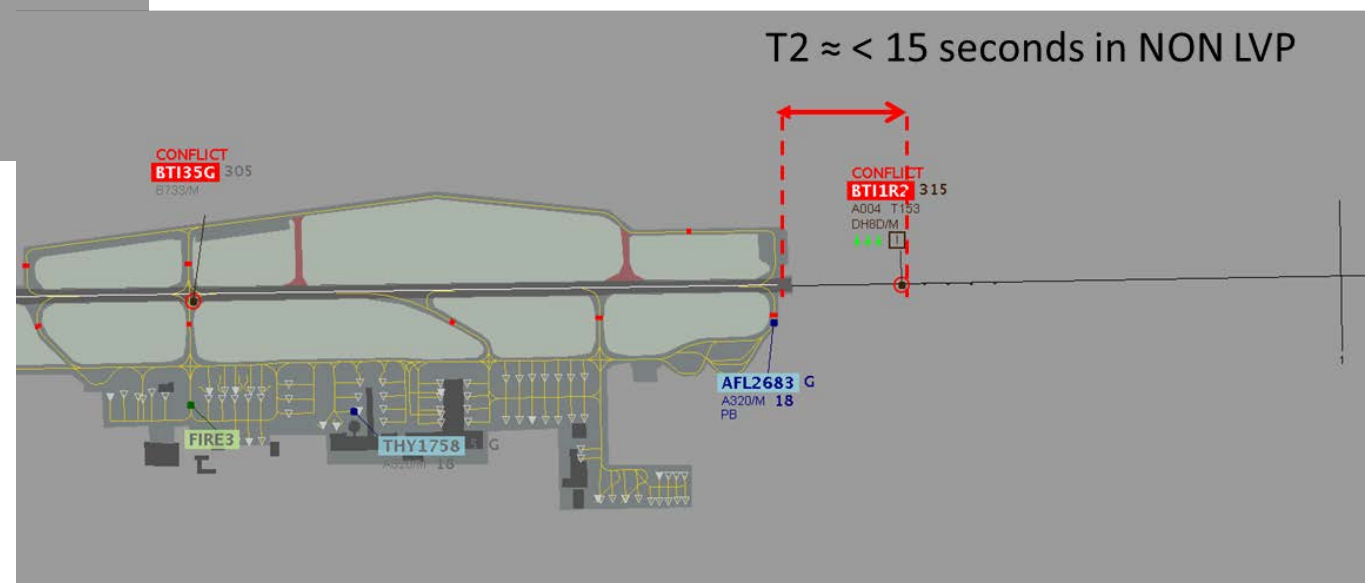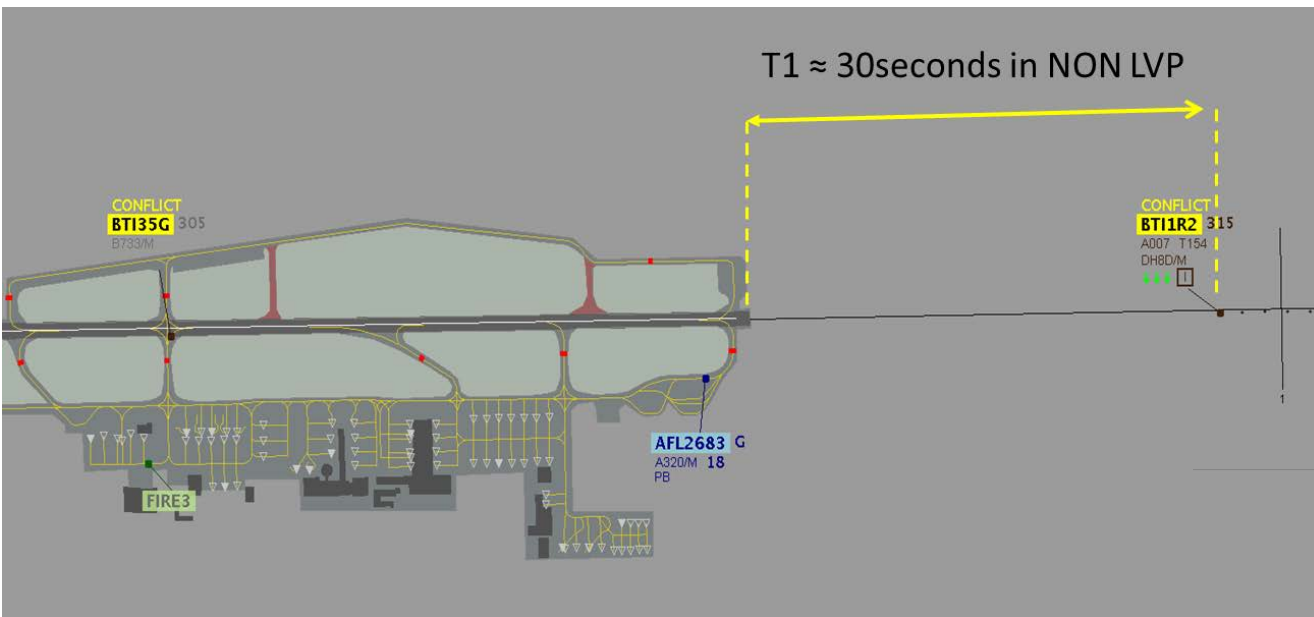
Examples of Alerts with an Arrival Conflicting with a Vacating Aircraft.

SUMMARY – AIRPORT SAFETY SUPPORT SERVICE

Recommended to have a stepped implementation (RMCA > CATC > CMAC (without and with Routing)

CATC and CMAC are seen as predictive alerts that should trigger before RMCA (which is a short notice alert)

**If the Controller/Pilot are doing their job correctly and the alerts are tuned to the local procedures the Controller will not see any alerts !!**

(In car terms - RMCA = Airbag, CATC = No Seat Belt attached, handbreak on, CMAC = Oil low, ABS triggered, Tyre pressure low, alternator not charging etc.)

ROUTING SERVICE

Why do we need a route?

- Situational Awareness for Controllers.

- Some Airport Safety Support Alerts require it.

- The Guidance Service needs it for Follow the Greens.

- Provide accurate Taxi Times for A-CDM.

PLANNED ROUTE (AUTOMATICALLY GENERATED)
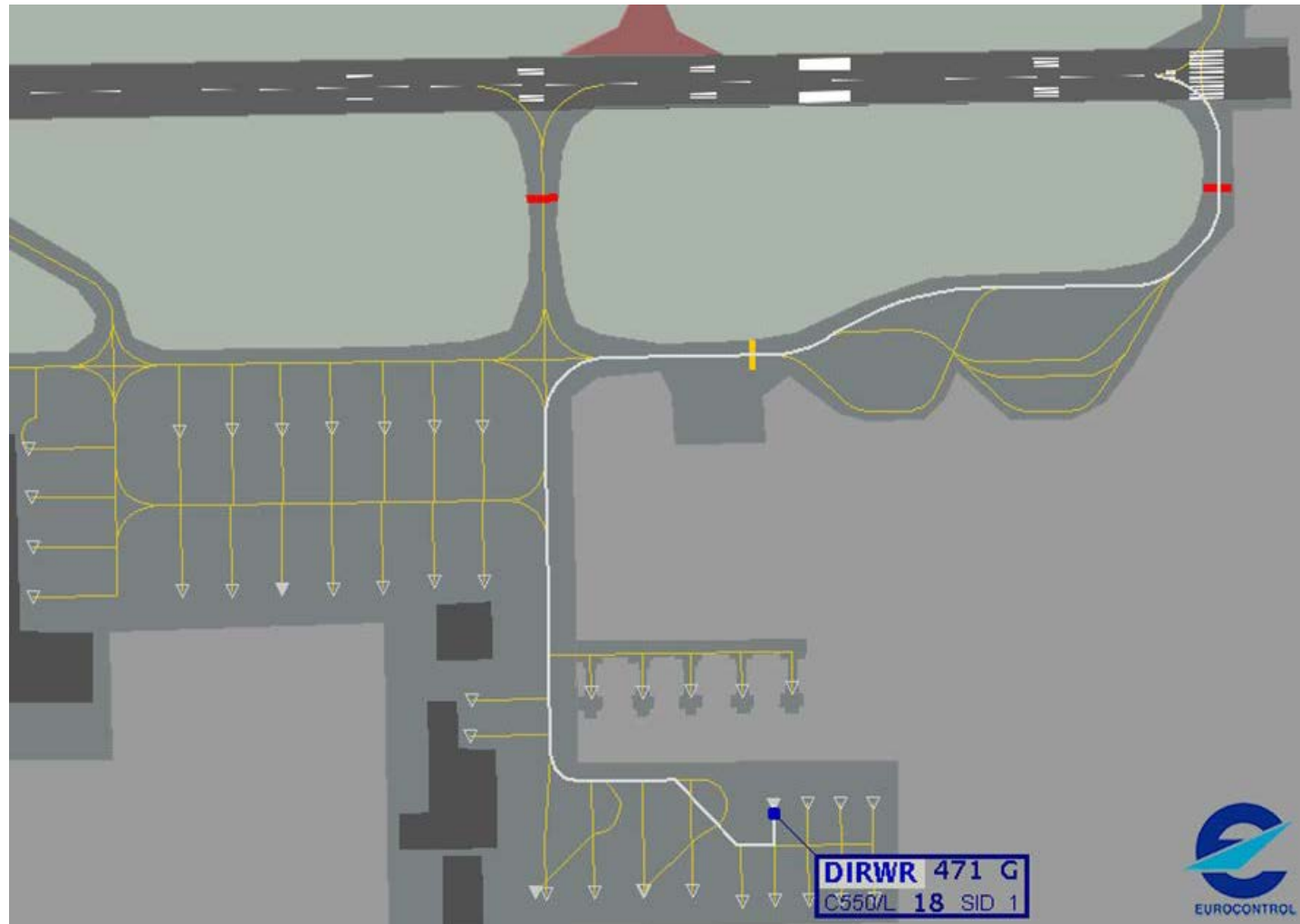
# CLEARED ROUTE AND PENDING ROUTE (ACTIVATED BY CONTROLLER INPUT)
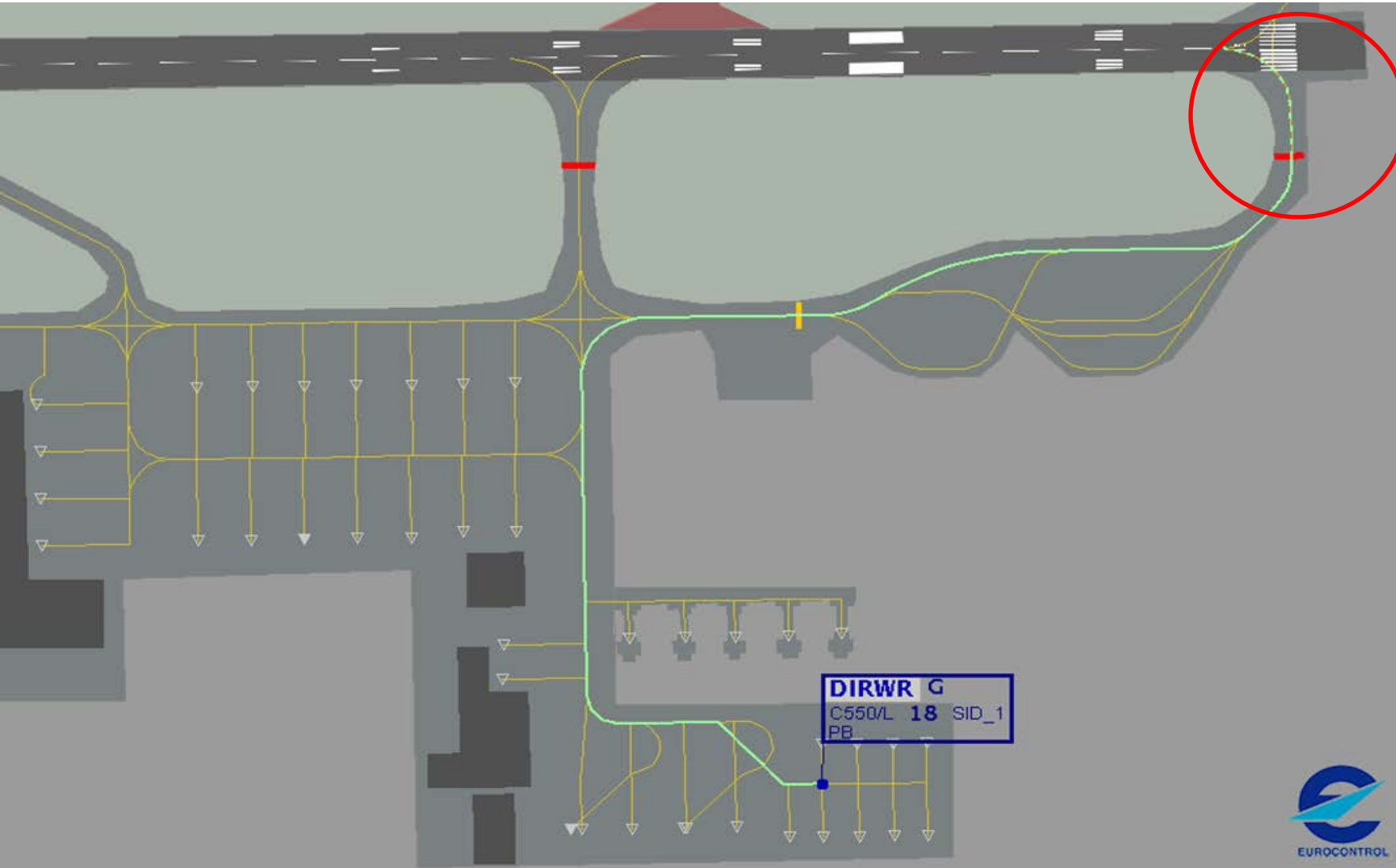
In the picture the small segment after the holding point leading onto the runway (dashed green line) represents the Pending Route.

ROUTE MODIFICATION

A modification to a generated route can either happen **before** the corresponding mobile has begun to move (e.g. planned route), **or after** the mobile starts moving (e.g. revision of a cleared/pending route).
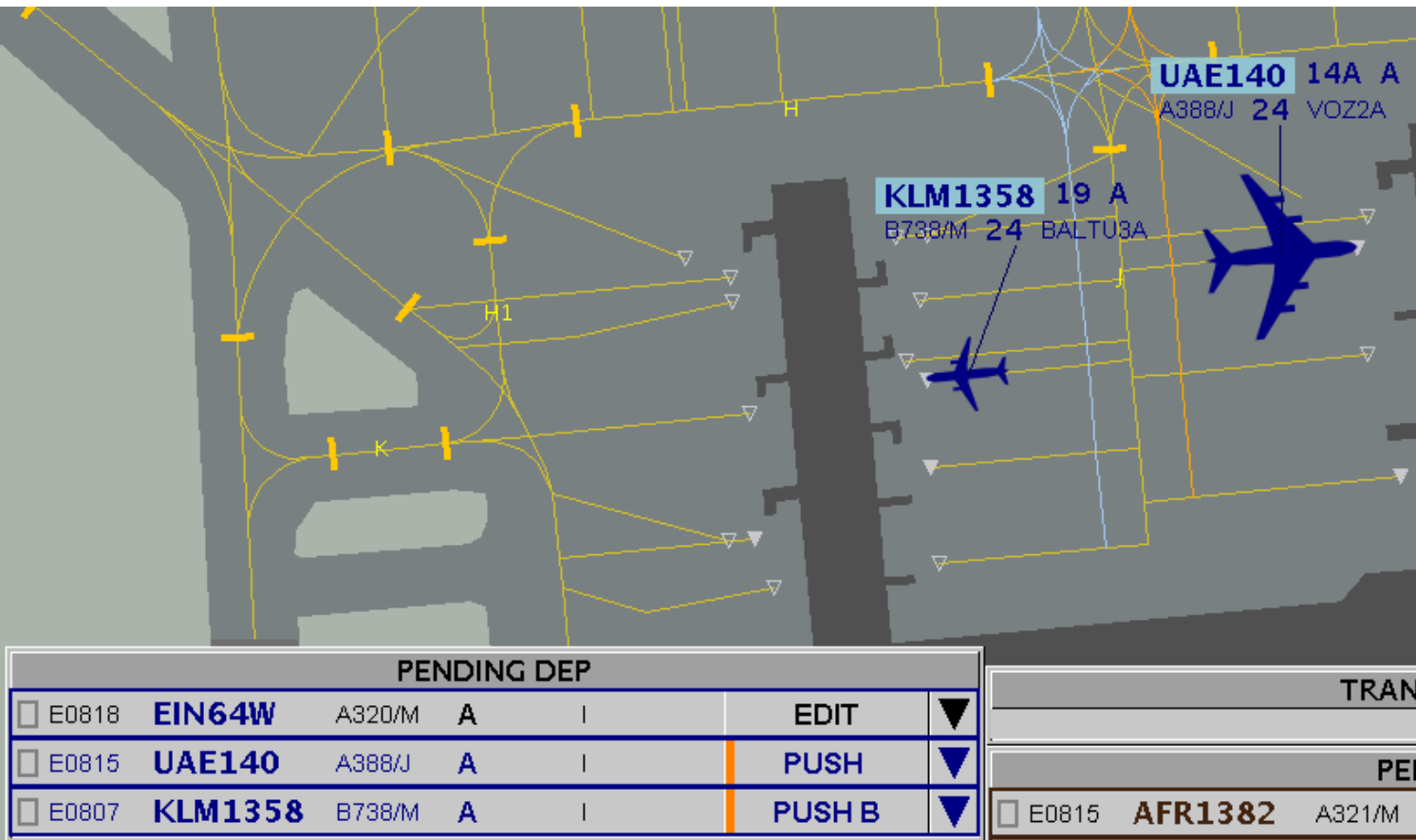
Some common route changes such as a change of runway, stand or holding point, **must be easily and quickly performed by the Controller** e.g. using drop down menus on the HMI.
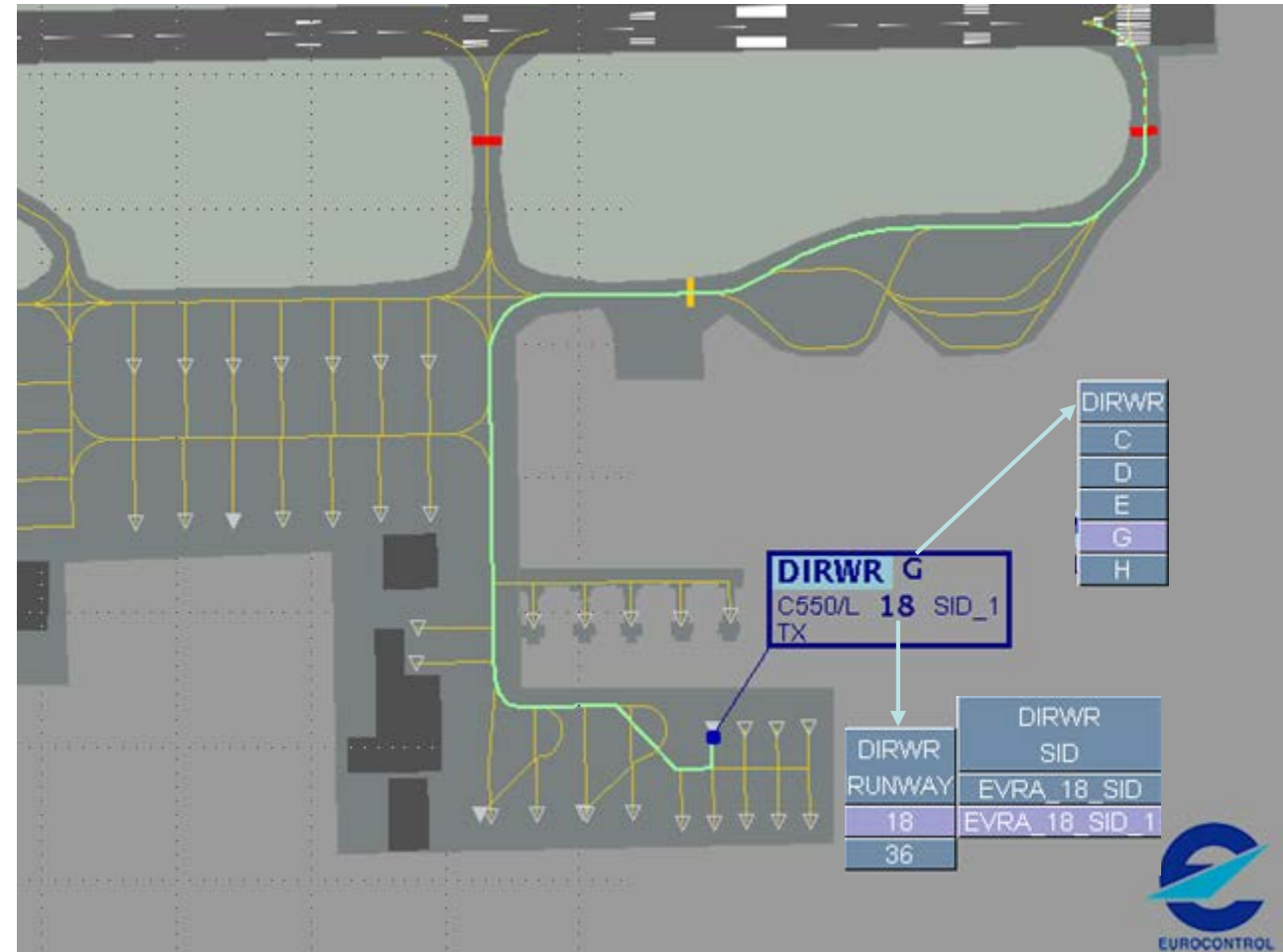
ROUTE OPTIONS FOR PUSH BACK
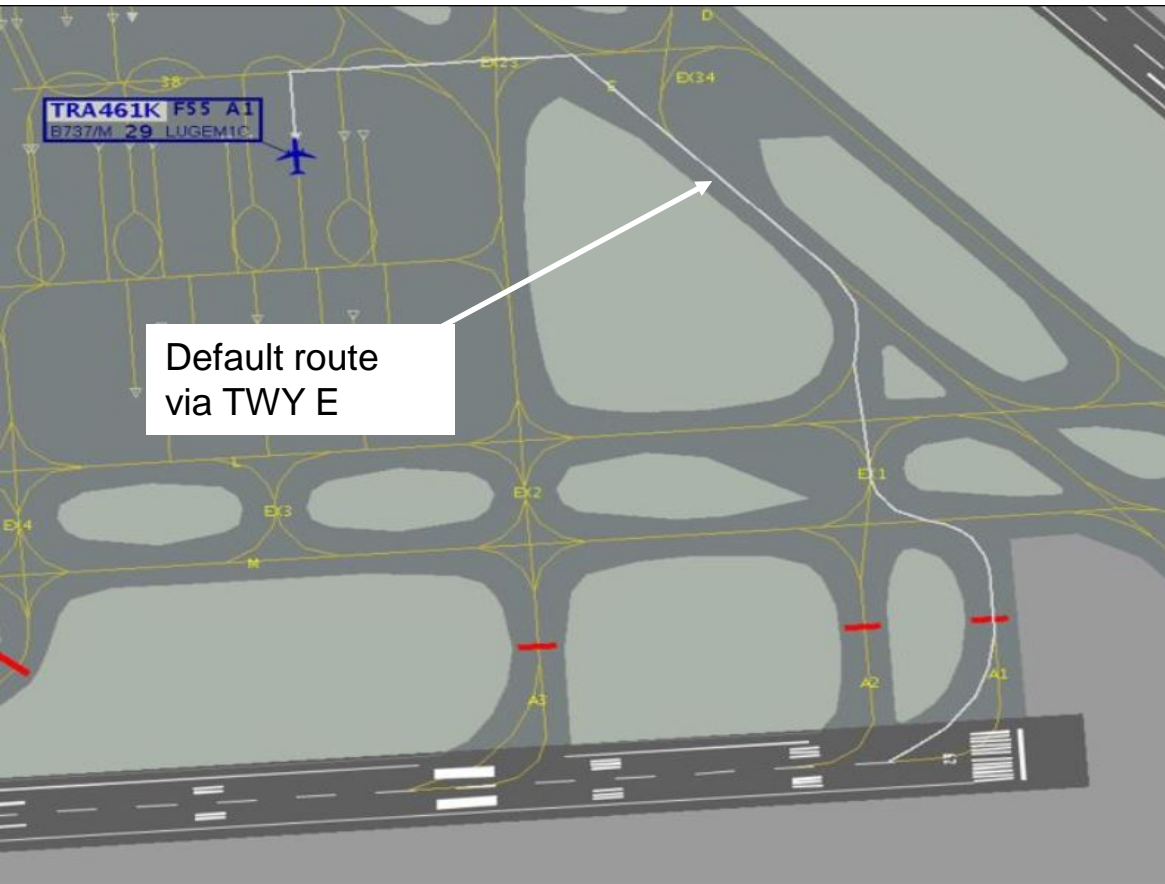
APTR – Alternative Parallel Taxi Routes
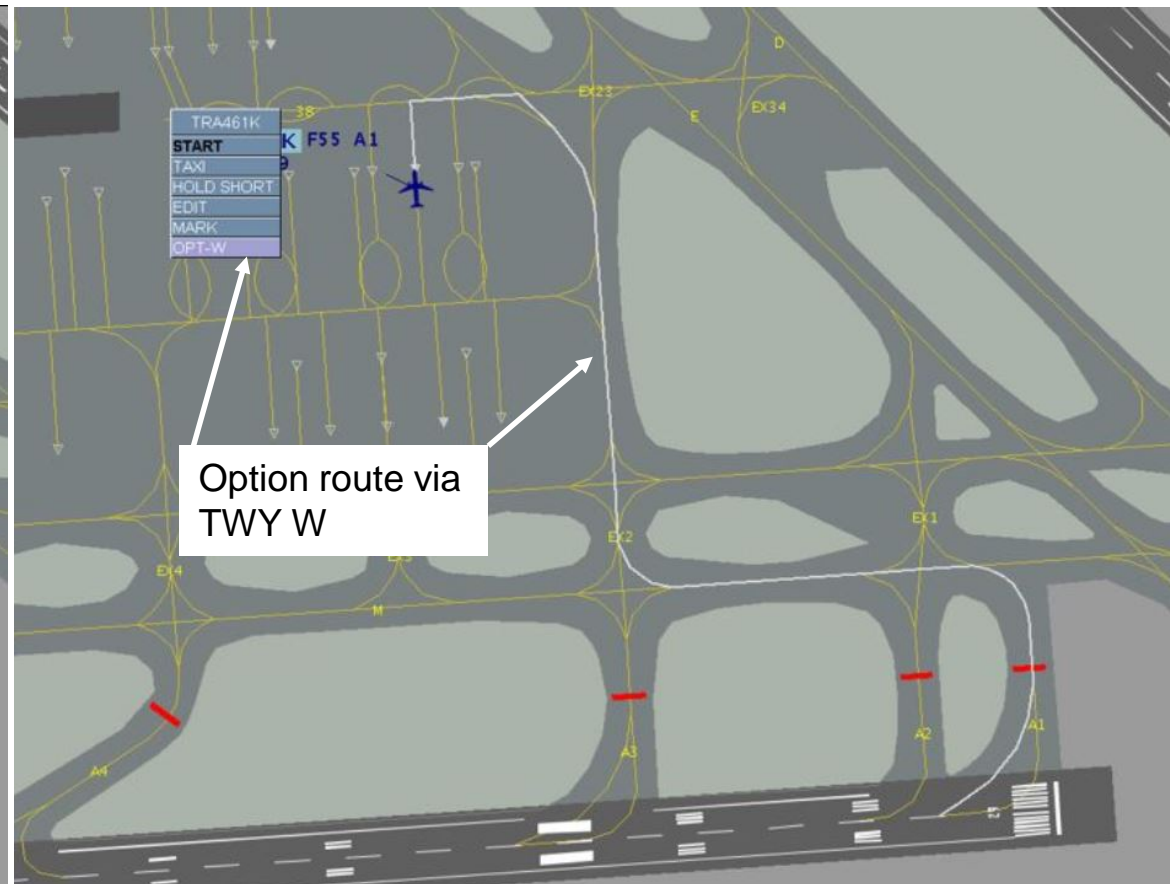

Other Push Back options can be

- Long Push
- Push and Pull forward
- Push Back Face ''N,S,E,W etc'

ALTERNATIVE ROUTES

Alternative Routes – If there are one or more routes that are often used as optional or short cuts, then these can be programmed in drop down menus and selected quickly with one click.
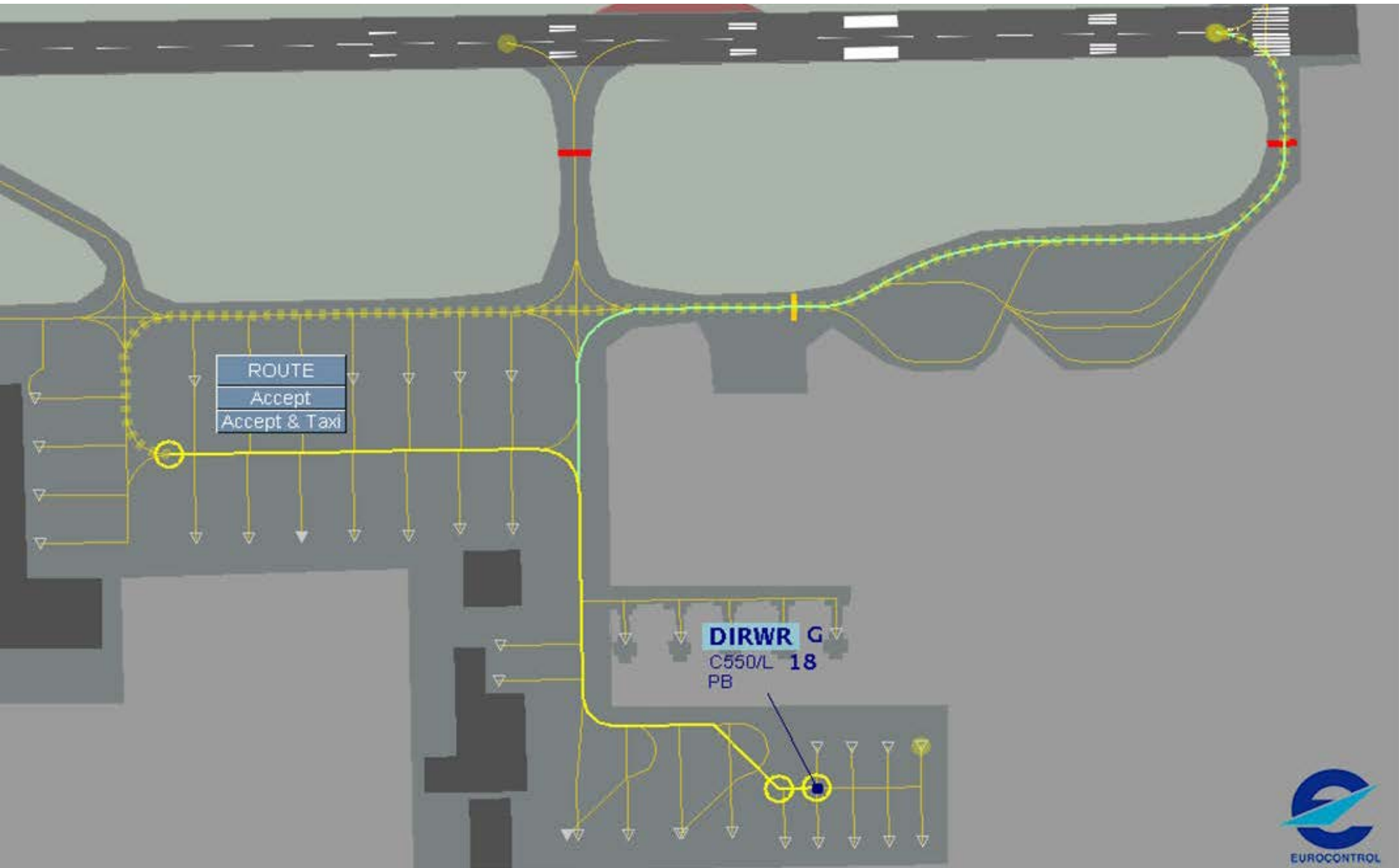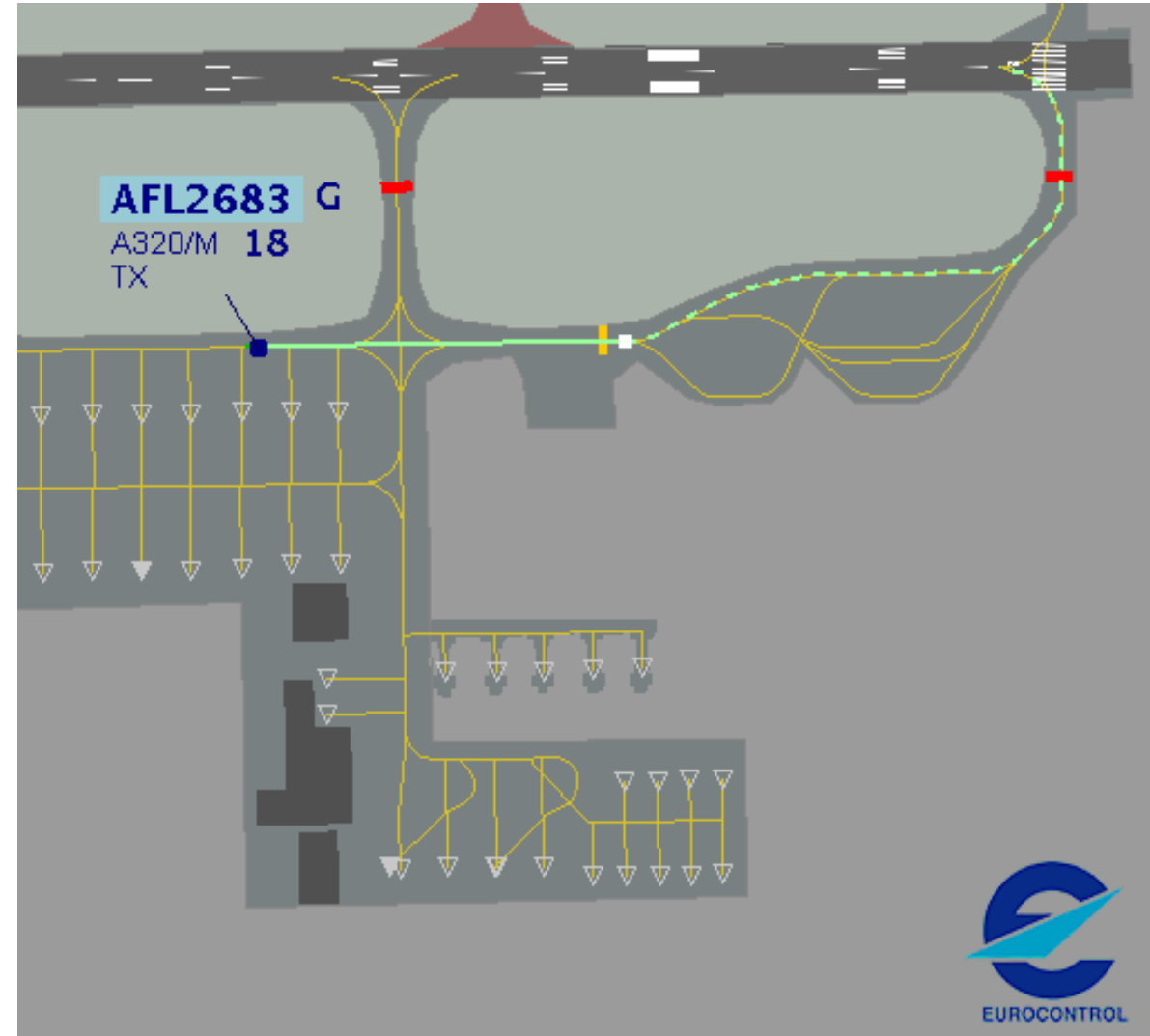

Default route via TWY E

Option route via TWY W

CONTROLLER INTERACTION WITH THE ROUTING SERVICE

INTERMEDIATE CLEARANCE LIMIT

This feature is essential if you intend to implement,

- Follow the Greens (Guidance Service).
- The NO TAXI Clearance alert.

SUMMARY - ROUTING SERVICE

Not easy to implement.

Essential to have a user friendly HMI which includes short cut options avoiding manual input where possible.

Involve Controllers when defining routes and options.

Conflict free routing and routing with ''intelligence'' not yet defined but could be the next step….

END OF PRESENTATION