Change ID: 5.1-43

Aircraft characteristics - revision

Summary

It is proposed to clarify the concept of "aircraft capability" by splitting its long list of values into several categories: navigationEquipment, verticalSeparation, surveillanceEquipment, etc.

Background

The AircraftCharacteristics class is used where necessary to indicate that an operational aspect is related with a certain kind of aircraft, equipment or capability. It includes a complex property modelled as a related "object" class - "AircraftCapability" , which allows multiple occurrences of equipment, navigation specification, etc.

Rationale for the change

The AircraftCapability has a single "capability" attribute with a long list of values CodeAircraftEquipmentType . But most of these values belong to different categories: navigation equipment, navigation specification, communication equipment, etc.

Therefore, it is proposed to add distinct attributes in the AircraftCharacteristics class for:

- navigationEquipment (DME, VOR/DME, DME/DME, INS, FMS, etc.)
- navigationSpecification (B-RNAV, RNP, etc.)
- verticalSeparationCapability (RVSM, nonRVSM)
- antiColisionAndSeparationEquipment (TCAS, ASAS, GPWS, etc.)
- communicationEquipment (HF, VHF, UHF, 8.33, etc.)
- surveillanceEquipment (ADS-B, SSR, SSR_1, etc.)

This will improve the clarity of the model and will allow to easier define combinations of capabilities, such as DME/DME and B-RNAV. It would also facilitate the further maintenance of these list of values.

Change proposal details

In the AircraftCharacteristic class add new attributes:

- navigationEquipment = " *An indication of the aircraft capability to use a certain ground based, satellite based or on-board system for aerial navigation*", data type CodeNavigationEquipmentType;
- navigationSpecification = " *A a set of aircraft and flight crew requirements needed to support performance-based navigation operations.*", data type CodeNavigationSpecificationType;
- verticalSeparationCapability = " *An indication of the aircraft capability to maintain a specified vertical separation*", data type CodeRVSMType;
- antiColisionAndSeparationEquipment = " *An indication of the aircraft equipment with collision avoidance systems*", data type CodeEquipmentAntiCollisionType;
- communicationEquipment = " *An indication of the aircraft equipment with voice and data communication devices*", data type CodeCommunicationModeType;
- surveillanceEquipment " *An indication of the aircraft capability for operating with a certain surveillance system*", data type CodeTransponderType;

Insert a new "codelist" data type CodeNavigationEquipmentType class

- definition = " *A coded list if values indicating the aircraft capability to use a certain ground based, satellite based or on-board system for aerial navigation*"
- open list of values:
  - DME =" *DME Receiver*"

    - VOR_DME = " *VOR/DME Receiver*"
    - DME_DME = " *DME/DME Receiver*"
    - TACAN = " *TACAN Receiver*"
    - ILS = " *Instrument Landing System*"
    - MLS = " *Microwave Landing System*"
    - GNSS = " *Global Navigation Satellite System*"
    - WAAS = " *Wide Area Augmentation System*"
    - LORAN = " *LORAN Receiver*"
    - INS = " *Inertial Navigation System*"
    - FMS = " *Flight Management System*"

Insert a new "codelist" data type CodeNavigationSpecificationType as follows:

- definition = "A coded list of values that indicate a set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications: RNP (includes the requirement for performance monitoring and alerting) and RNAV (does not include the requirement for performance monitoring and alerting)"
- list of values (open):
    - RNAV_10 = RNAV 10 (RNP 10) capability - for oceanic and remote continental navigation applications
    - RNAV_5 = RNAV 5 capability - for en-route and terminal navigation applications
    - RNAV_2 = RNAV 2 capability - for en-route and terminal navigation applications
    - RNAV_1 = RNAV 1 capability - for en-route and terminal navigation applications
    - RNP_4 = RNP 4 capability - for oceanic and remote continental navigation applications
    - RNP_2 = RNP 2 capability (specification to be developed by ICAO) - for various phases of flight
    - BASIC_RNP_1 = Basic RNP 1 capability - for various phases of flight
    - ADVANCED_RNP_1 = Advanced RNP 1 capability (specification to be developed by ICAO) - for various phases of flight
    - RNP_APCH = RNP approach capability
    - RNP_AR_APCH = RNP AR approach capability

Insert a new "enumeration" data type CodeEquipmentAntiCollisionType class

- definition = " *A coded list if values indicating the aircraft equipment with an anti-collision system*"
- enumerated list of values:
    - ACAS_I = " *Airborne Collision Avoidance System - version I, implemented as Traffic Alert and Collision Avoidance System (TCAS) I*"
    - ACAS_II = " *Airborne Collision Avoidance System - version II, implemented as Traffic Alert and Collision Avoidance System (TCAS) II version 7*"
    - GPWS = " *Ground proximity warning system*"
    - Other = " *Other*".

Modify the CodeCommunicationModeType data type:

- insert a new value VHF_833 = " *Very High Frequency radio voice channel with 8.33 KHz spacing*"
- modify the definition of the VHF value = " *Very High Frequency radio voice channel with 25 KHz spacing*"
- insert a new value UHF = " *Ultra High Frequency radio voice channel*"

Delete the CodeAircraftEquipmentType data type.
Delete the AircraftCapability class.