Data model and schema extensions that accommodate regional needs

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Background

US maintains a number of filed differences with ICAO

- METAR/SPECI
- TAF
- SIGMET

Mostly, additional data

Need a way to convey these data within XML

Strategy, in XML

National-specific document…

```
<iwxxm-uk:METAR automatedReport="true" ...>
   <iwxxm:validTime>...</iwxxm:validTime>
   <iwxxm-uk:ukContent>...</iwxxm-uk:ukContent>
   ...
</iwxxm-uk:METAR>
```

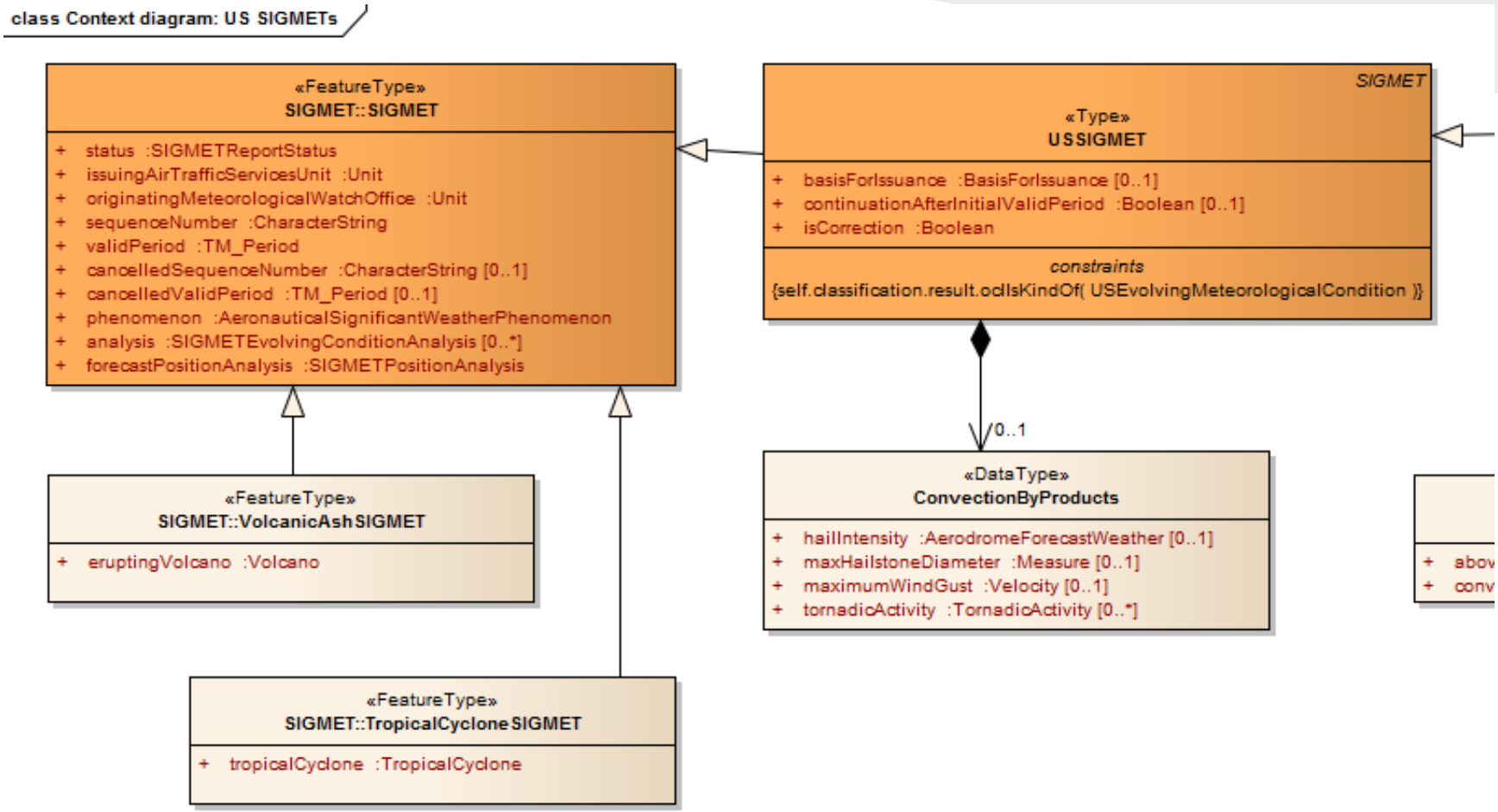
Strategy, in XML

National-specific document...

must be converted to ICAO/WMO compliant document before international dissemination.

```
<iwxxm:METAR automatedReport="true" ...>
   <iwxxm:validTime>...</iwxxm:validTime>
   ...
</iwxxm:METAR>
```

Strategy, in UML



Consequences

Only extensions

- No subtractions
- No alterations

Regional namespace(s) required

“Sanitization” software required

US Regional Extension (iwxxm-us)

Four new data models/schemas

- USMETAR
- USSPECI
- USTAF
- USSIGMET

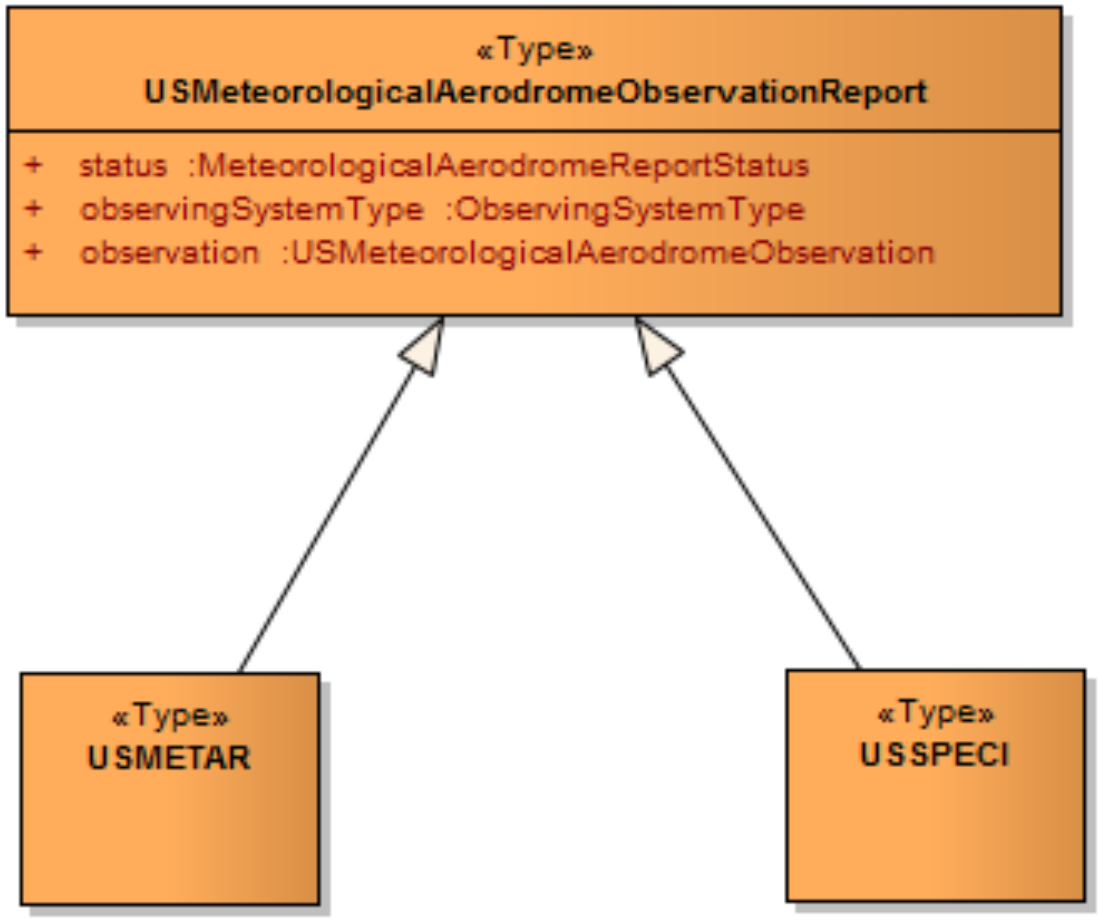
New namespace

http://www.weather.gov/schemas/external/iwxxm-us

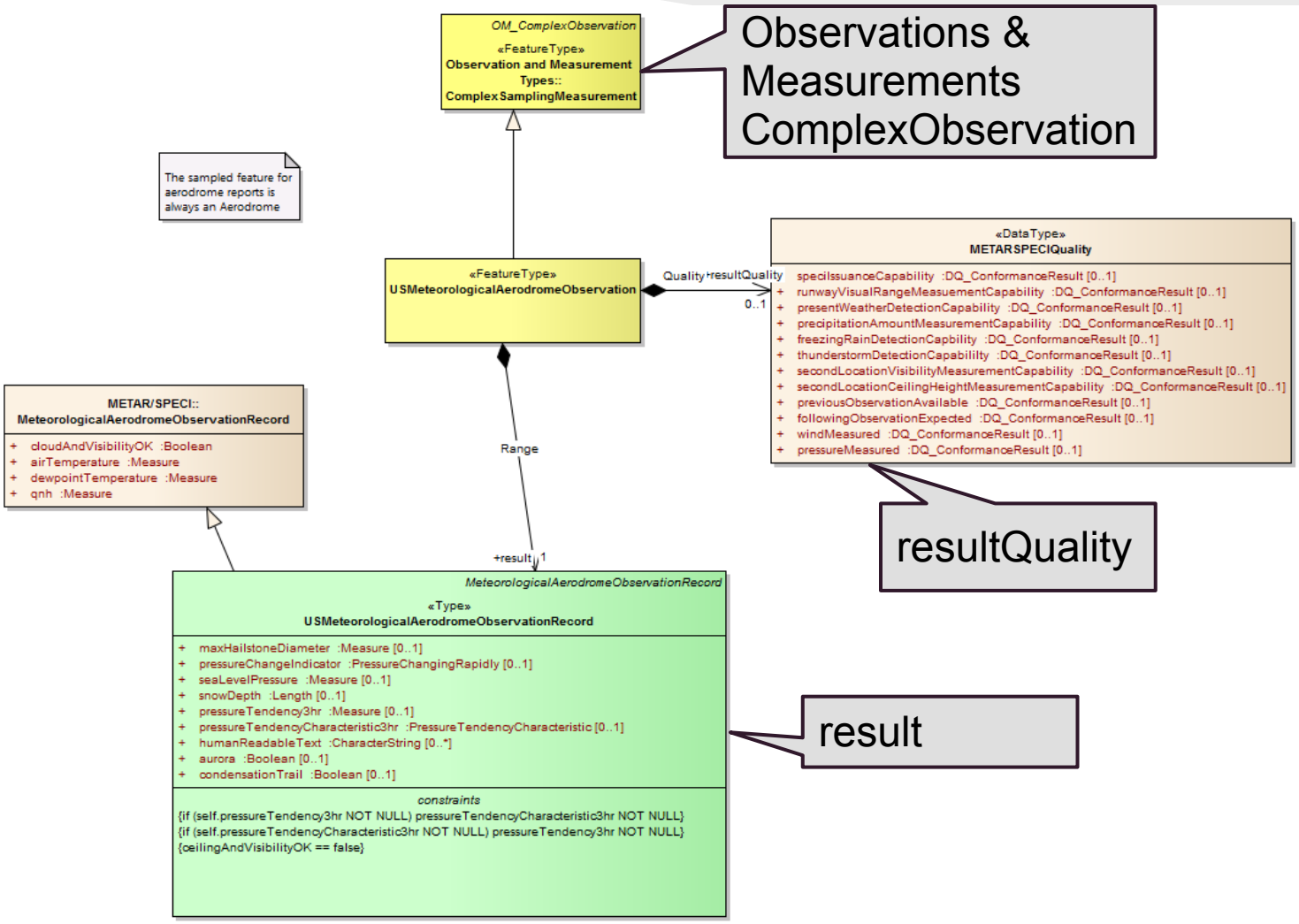
Attributes of iwxxm-us

- Extensions only
- Re-use of METCE/IWXXM constructs, where possible
- Use of quantity attribute, as in IWXXM
- Use of code lists and vocabulary attribute, as in IWXXM

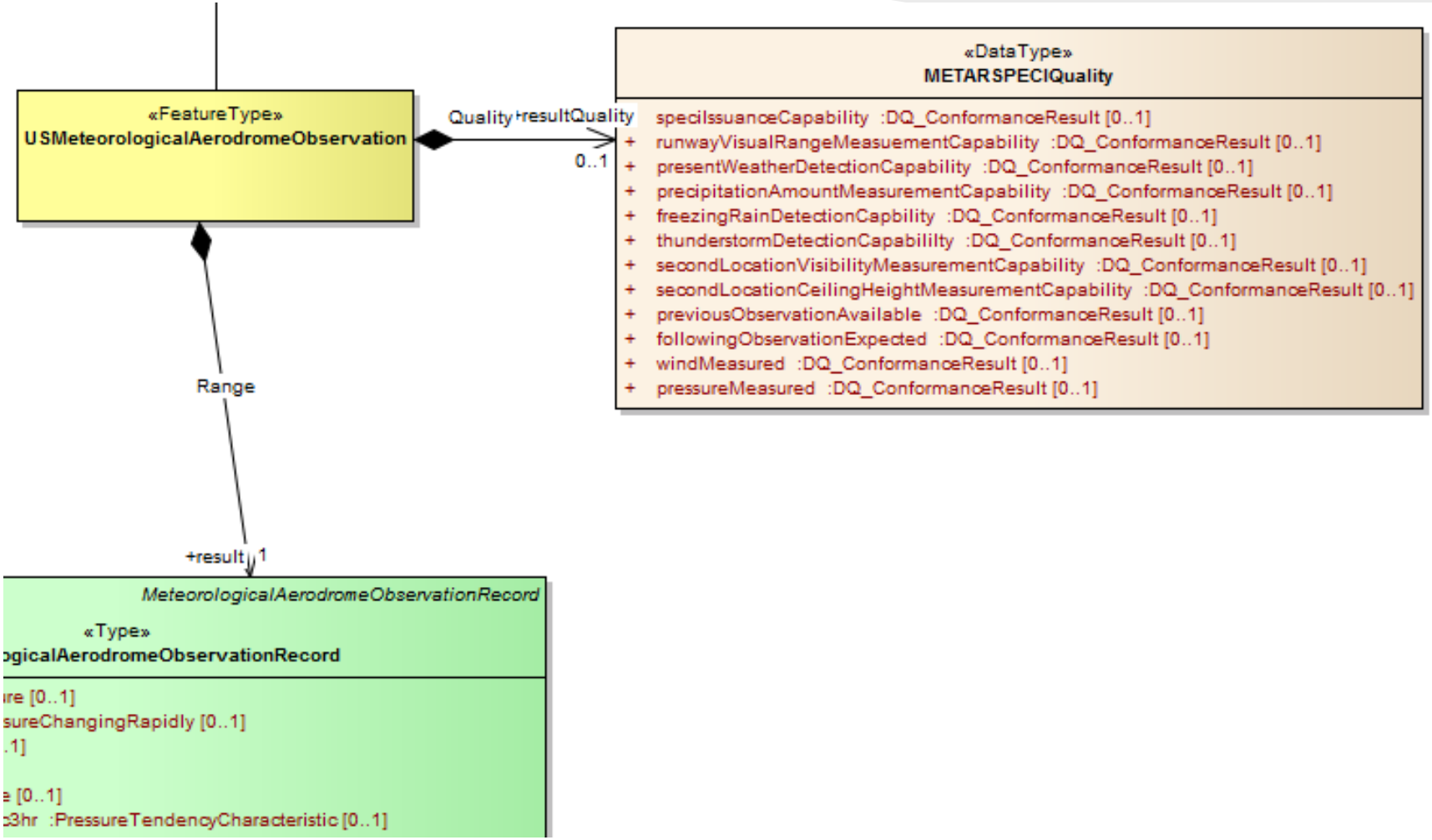
USMETAR and USSPECI



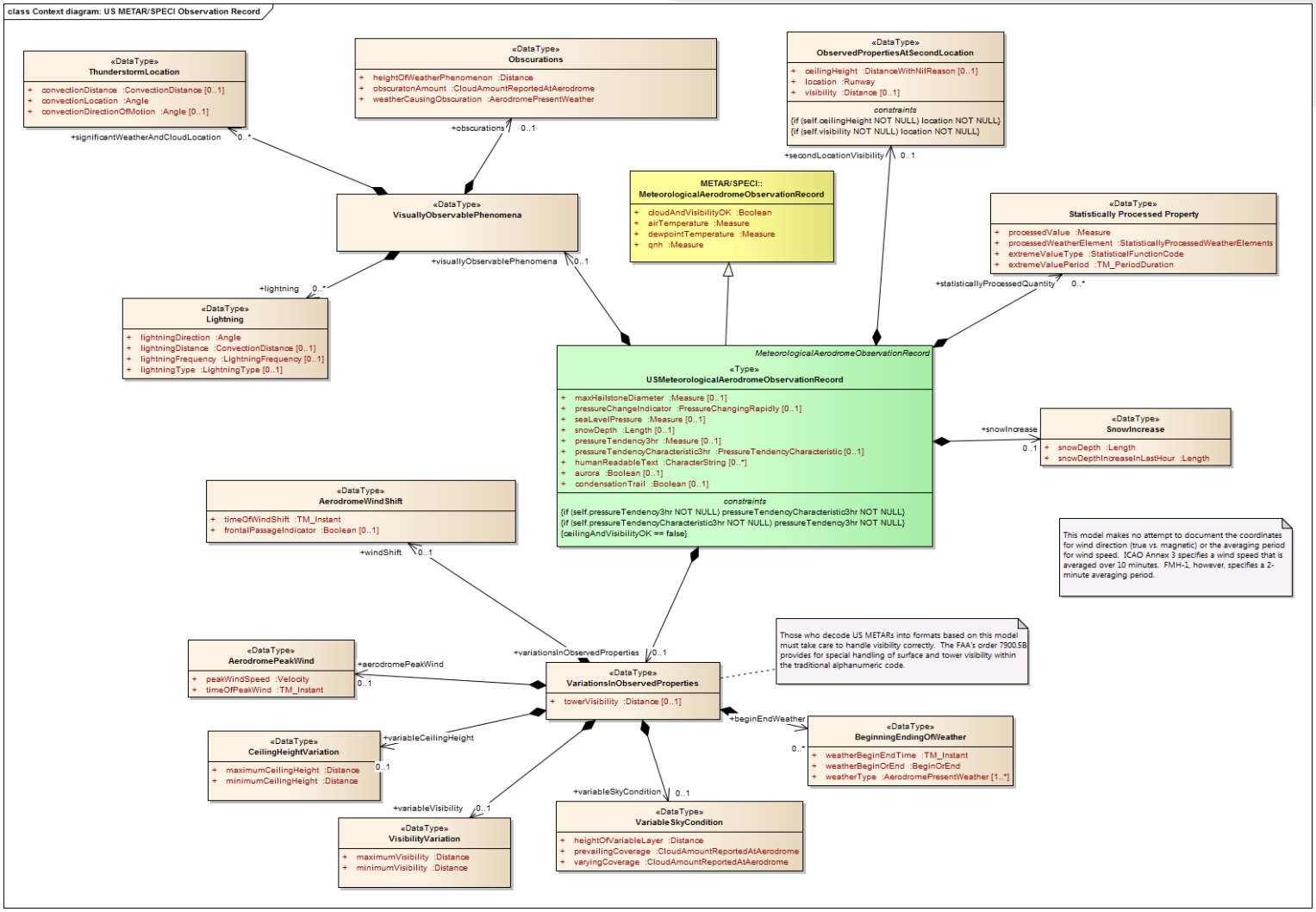
USMeteorologicalAerodromeObservation



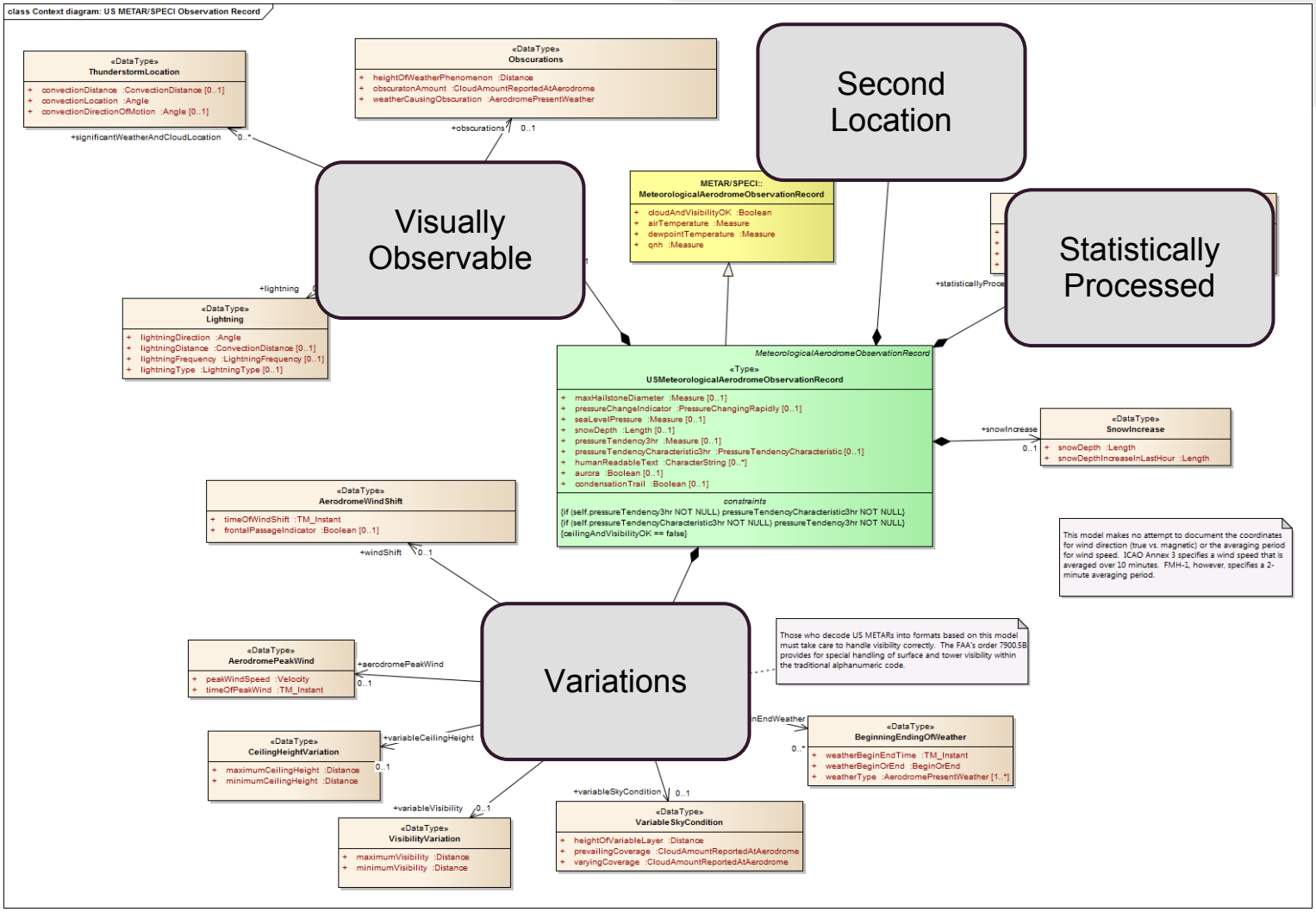
USMeteorologicalAerodromeObservation



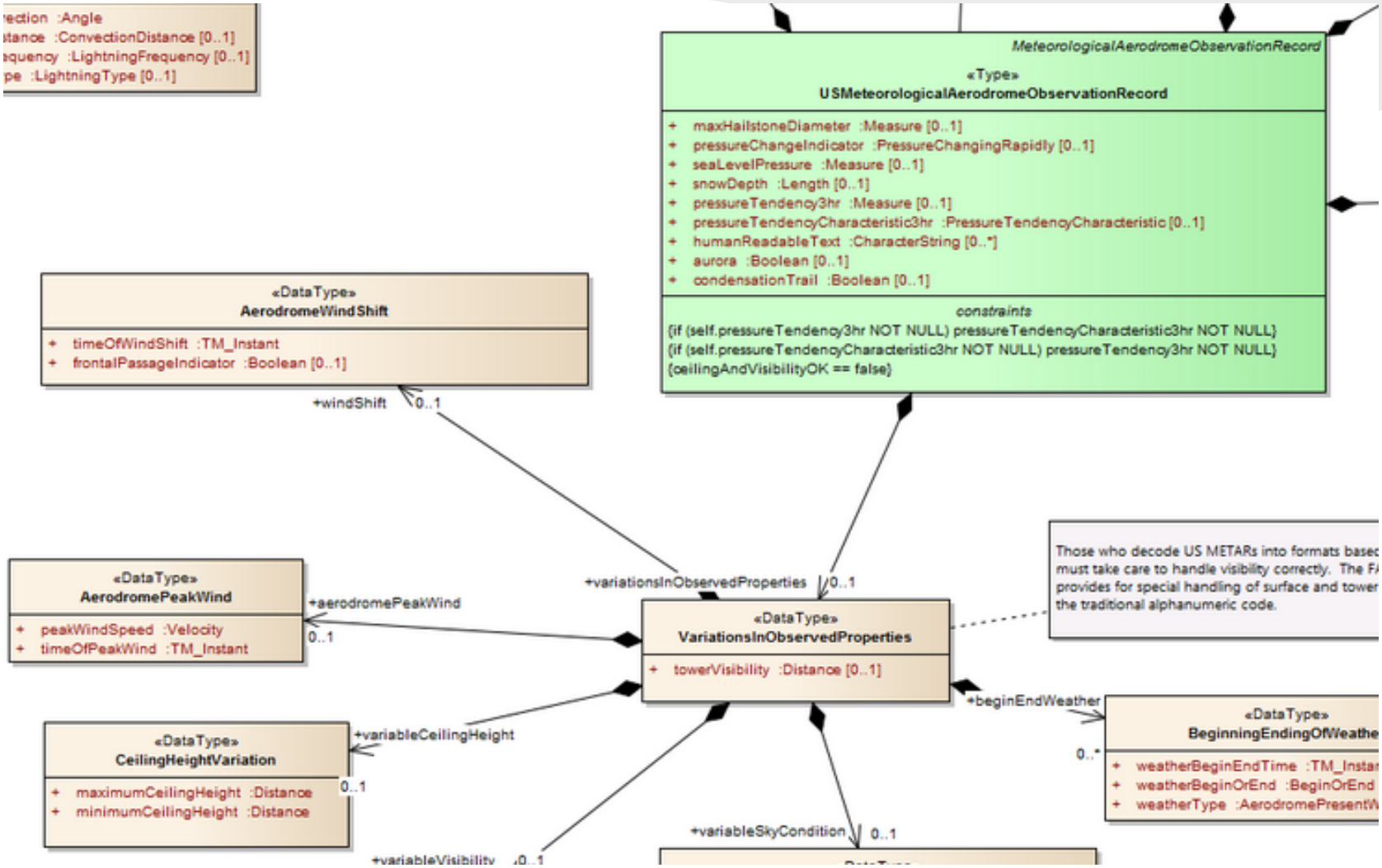
USMeteorologicalAerodromeObservationRecord



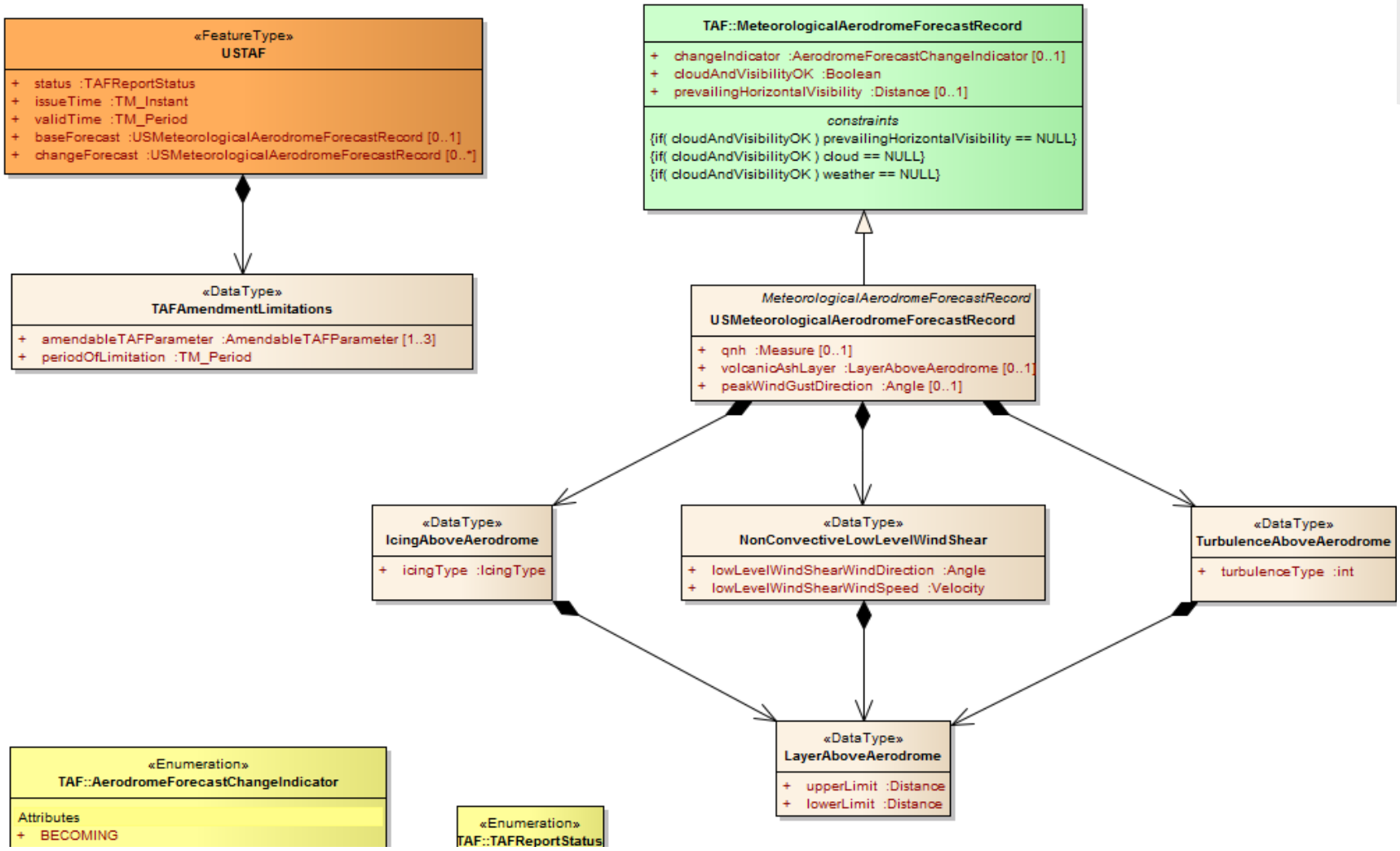
USMeteorologicalAerodromeObservationRecord



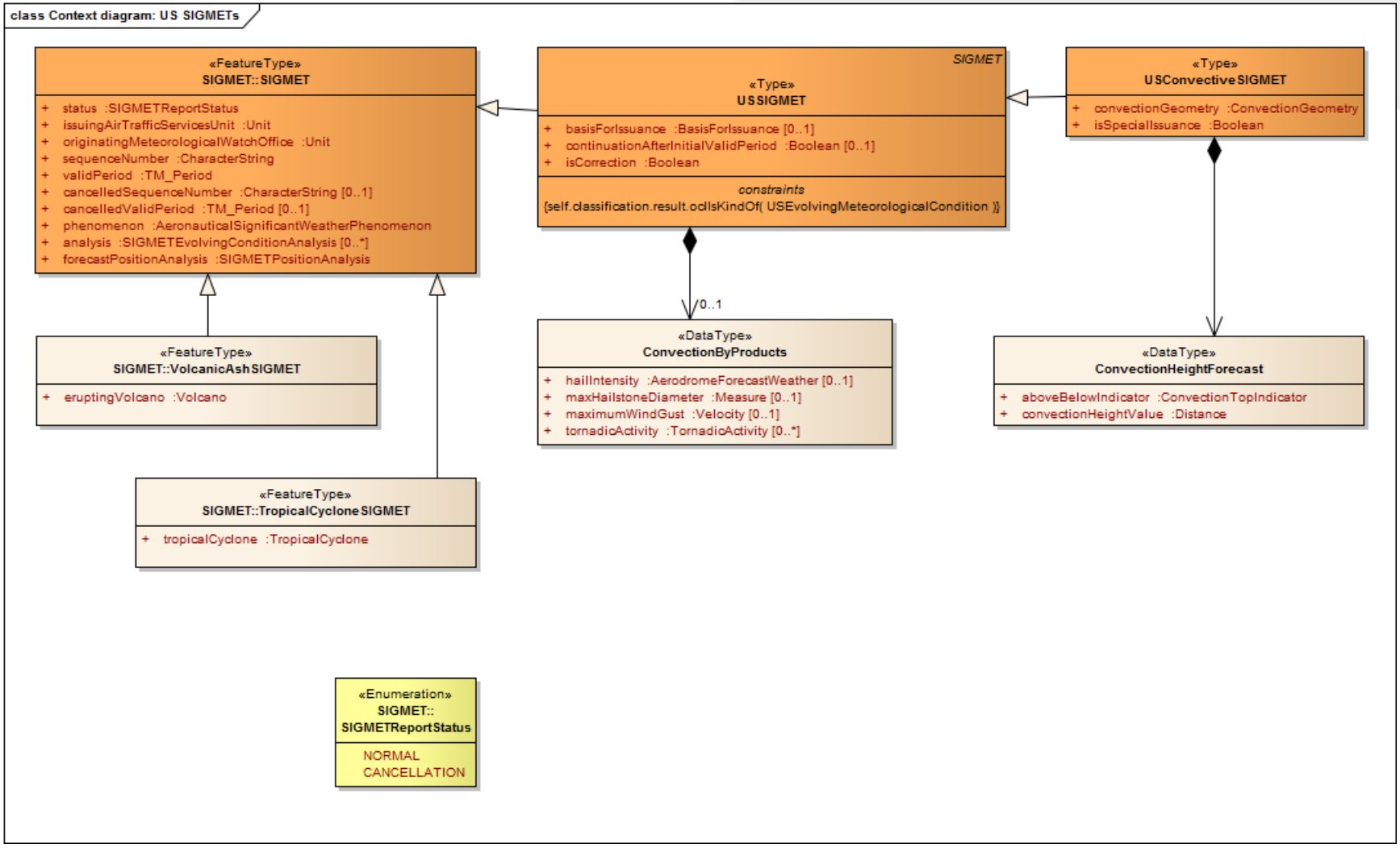
USMeteorologicalAerodromeObservationRecord



USTAF


«FeatureType»
USTAF
+ status :TAFReportStatus
+ issueTime :TM_Instant
+ validTime :TM_Period
+ baseForecast :USMeteorologicalAerodromeForecastRecord [0..1]
+ changeForecast :USMeteorologicalAerodromeForecastRecord [0..*]
«DataType»
TAFAmendmentLimitations
+ amendableTAFParameter :AmendableTAFParameter [1..3]
+ periodOfLimitation :TM_Period
TAF::MeteorologicalAerodromeForecastRecord
+ changeIndicator :AerodromeForecastChangeIndicator [0..1]
+ cloudAndVisibilityOK :Boolean
+ prevailingHorizontalVisibility :Distance [0..1]
constraints
{if(cloudAndVisibilityOK) prevailingHorizontalVisibility == NULL}
{if(cloudAndVisibilityOK) cloud == NULL}
{if(cloudAndVisibilityOK) weather == NULL}
MeteorologicalAerodromeForecastRecord
USMeteorologicalAerodromeForecastRecord
+ qnh :Measure [0..1]
+ volcanicAshLayer :LayerAboveAerodrome [0..1]
+ peakWindGustDirection :Angle [0..1]
«DataType»
IcingAboveAerodrome
+ icingType :IcingType
«DataType»
NonConvectiveLowLevelWindShear
+ lowLevelWindShearWindDirection :Angle
+ lowLevelWindShearWindSpeed :Velocity
«DataType»
TurbulenceAboveAerodrome
+ turbulenceType :int
«DataType»
LayerAboveAerodrome
+ upperLimit :Distance
+ lowerLimit :Distance
«Enumeration»
TAF::AerodromeForecastChangeIndicator
Attributes
+ BECOMING
«Enumeration»
TAF::TAFReportStatus

USSIGMET


class Context diagram: US SIGMETs
«FeatureType»
SIGMET::SIGMET
+ status :SIGMETReportStatus
+ issuingAirTrafficServicesUnit :Unit
+ originatingMeteorologicalWatchOffice :Unit
+ sequenceNumber :CharacterString
+ validPeriod :TM_Period
+ cancelledSequenceNumber :CharacterString [0..1]
+ cancelledValidPeriod :TM_Period [0..1]
+ phenomenon :AeronauticalSignificantWeatherPhenomenon
+ analysis :SIGMETEvolvingConditionAnalysis [0..*]
+ forecastPositionAnalysis :SIGMETPositionAnalysis
SIGMET
«Type»
USSIGMET
+ basisForIssuance :BasisForIssuance [0..1]
+ continuationAfterInitialValidPeriod :Boolean [0..1]
+ isCorrection :Boolean
constraints
{self.classification.result.oclIsKindOf(USEvolvingMeteorologicalCondition)}
«Type»
USConvectiveSIGMET
+ convectionGeometry :ConvectionGeometry
+ isSpecialIssuance :Boolean
0..1
«FeatureType»
SIGMET::VolcanicAshSIGMET
+ eruptingVolcano :Volcano
«DataType»
ConvectionByProducts
+ hailIntensity :AerodromeForecastWeather [0..1]
+ maxHailstoneDiameter :Measure [0..1]
+ maximumWindGust :Velocity [0..1]
+ tornadicActivity :TornadicActivity [0..*]
«DataType»
ConvectionHeightForecast
+ aboveBelowIndicator :ConvectionTopIndicator
+ convectionHeightValue :Distance
«FeatureType»
SIGMET::TropicalCycloneSIGMET
+ tropicalCyclone :TropicalCyclone
«Enumeration»
SIGMET::
SIGMETReportStatus
NORMAL
CANCELLATION

Schemas and Code Lists

Planned go-live 15 October 2013

- http://www.weather.gov/schemas/external/iwxxm-us
- http://www.weather.gov/codes