United States' IWXXM Extensions for TAF

Version 3.0 ● Approved

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TAF

Package «Leaf» in 'US Extensions to IWXXM model'

This package includes the information needed to model the Federal Aviation Administration's filed differences to the International Civil Aviation Organization for the Terminal Aerodrome Forecast (TAF) product. Two US manuals document the forecast practices and were used to guide the development of this package.

The National Weather Service's Aviation Services Branch maintains NWS Instruction 10-813 for its forecasters.

The Secretary of the US Air Force maintains the Air Force Manual 15-124, Weather Codes, for its airmen.

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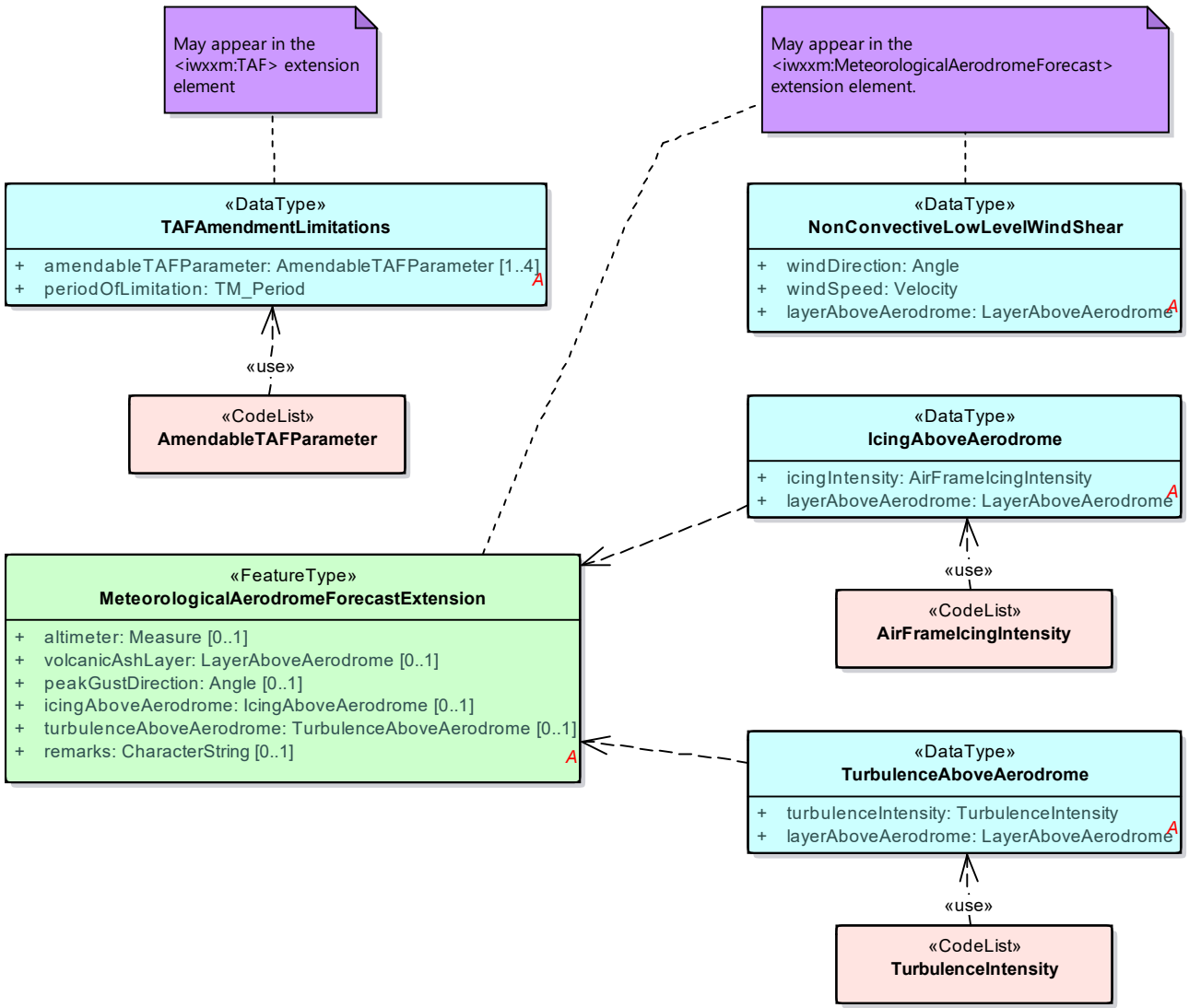
TerminalAerodromeForecast

GML diagram in package 'TAF'

Last modified: 4/2/2021



MeteorologicalAerodromeForecastExtension

Class «FeatureType»

A UML data type containing meteorological parameters at an aerodrome as needed by the United States TAFs. This UML type is transformed into XML as a complex type, MeteorologicalAerodromeForecastExtension.

The MeteorologicalAerodromeForecastExtension complex type may appear in the <iwxxm:MeteorologicalAerodromeForecast> extension element.

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ATTRIBUTES

altimeter: **Measure** type
Multiplicity: [0..1]

Forecasted lowest altimeter setting expected during the forecast period.

volcanicAshLayer: **LayerAboveAerodrome** type
Multiplicity: [0..1]

Forecast base and top of volcanic ash cloud (layer).

peakGustDirection: **Angle** type
Multiplicity: [0..1]

Forecast of expected direction of wind gusts.

icingAboveAerodrome: **IcingAboveAerodrome** type
Multiplicity: [0..1]

Forecasted icing layer(s) aloft.

turbulenceAboveAerodrome: **TurbulenceAboveAerodrome** type
Multiplicity: [0..1]

Forecasted layer(s) of turbulence above the aerodrome.

remarks: **CharacterString** type
Multiplicity: [0..1]

Supplemental information entered as plaintext by the forecaster.

SAMPLE INSTANCES

Description	XML Fragment

Forecast altimeter setting of 30.01" Hg	`<iwxxm-us:MeteorologicalAerodromeForecastExtension>`
	`  <iwxxm-us:altimeter uom="[in_Hg]">30.01</iwxxm-us:altimeter>`
	`</iwxxm-us:MeteorologicalAerodromeForecastExtension>`

Forecast peak wind direction of 350°	`<iwxxm-us:MeteorologicalAerodromeForecastExtension>`
	`  <iwxxm-us:peakGustDirection uom="deg">350</iwxxm-us:peakGustDirection>`
	`</iwxxm-us:MeteorologicalAerodromeForecastExtension>`

Forecast volcanic ash layer from the surface to 7000 feet AGL	`<iwxxm-us:MeteorologicalAerodromeForecastExtension>`
	`  <iwxxm-us:volcanicAshLayer>`
	`  <iwxxm-us:lowerLimit uom="[ft_i]">0</iwxxm-us:lowerLimit>`
	`  <iwxxm-us:upperLimit uom="[ft_i]">7000</iwxxm-us:upperLimit>`

SAMPLE INSTANCES	
Description	**XML Fragment**
	`</iwxxm-us:volcanicAshLayer>` `</iwxxm-us:MeteorologicalAerodromeForecastExtension>`

Forecaster remarks	`<iwxxm-us:MeteorologicalAerodromeForecastExtension>`
	`<iwxxm-us:remarks>SHRA OMTNS 1414-1419</iwxxm-us:remarks>`
	`</iwxxm-us:MeteorologicalAerodromeForecastExtension>`

IcingAboveAerodrome

Class «DataType»

A UML data type containing elements describing an icing forecast for layer(s) above the aerodrome. This UML type is transformed into XML as a complex type, IcingAboveAerodrome.

The IcingAboveAerodrome complex type may appear in the <iwxxm-us:MeteorologicalAerodromeForecastExtension> element.

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Last modified: 12/22/2022

ATTRIBUTES

icingIntensity: **AirFrameIcingIntensity** type

Character and intensity of icing in the layer.

Properties:
sequenceNumber = 1

layerAboveAerodrome: **LayerAboveAerodrome** type

Vertical top and bottom of the icing layer.

Properties:
sequenceNumber = 2

SAMPLE INSTANCES

Description	XML Fragment
Forecast of light icing in clouds from 15 to 21 thousand feet	<iwxxm-us:IcingAboveAerodrome> <iwxxm-us:icingIntensity xlink:href="http://codes.nws.noaa.gov/AFMAN/15-124/IcingType/2"/> <iwxxm-us:layerAboveAerodrome> <iwxxm-us:lowerLimit uom="[ft_i]">15000</iwxxm-us:lowerLimit> <iwxxm-us:upperLimit uom="[ft_i]">21000</iwxxm-us:upperLimit> </iwxxm-us:layerAboveAerodrome> </iwxxm-us:IcingAboveAerodrome>

NonConvectiveLowLevelWindShear

Class «DataType»

A UML data type containing elements describing low-level wind shear. Low-level wind shear forecasts will only refer to non-convective events and situations such as frontal passage, inversions, low-level wind jets, lee-side mountain flows, sea-breezes, Santa Ana winds, etc. This UML type is transformed into XML as a complex type, NonConvectiveLowLevelWindShear.

The NonConvectiveLowLevelWindShear complex type may appear in the <iwxxm:MeteorologicalAerodromeForecast> extension element.

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ATTRIBUTES

windDirection: **Angle** type

Wind direction at the top of the wind shear layer.

Properties:
sequenceNumber = 1

windSpeed: **Velocity** type

Wind speed at the top of the wind shear layer.

Properties:
sequenceNumber = 2

layerAboveAerodrome: **LayerAboveAerodrome** type

Vertical top and bottom of the wind shear layer.

Properties:
sequenceNumber = 3

SAMPLE INSTANCES

Description	XML Fragment

Wind shear layer from surface to 2000 feet AGL. Wind velocity at 2000 feet is 220° at 40 knots	`<iwxxm-us:NonConvectiveLowLevelWindShear>`
	`  <iwxxm-us:windDirection uom="deg">220</iwxxm-us:windDirection>`
	`  <iwxxm-us:windSpeed uom="[kn_i]">40</iwxxm-us:windSpeed>`
	`  <iwxxm-us:layerAboveAerodrome>`
	`  <iwxxm-us:lowerLimit uom="[ft_i]">0</iwxxm-us:lowerLimit>`
	`  <iwxxm-us:upperLimit uom="[ft_i]">2000</iwxxm-us:upperLimit>`
	`  </iwxxm-us:layerAboveAerodrome>`
	`</iwxxm-us:NonConvectiveLowLevelWindShear>`

TAFAmendmentLimitations

Class «DataType»

A UML data type describing a special set of rules on when and how amendments will be issued on particular element(s) of the TAF. This UML type is transformed into XML as a complex type, TAFAmendmentLimitations.

The TAFAmendmentLimitations complex type may appear in the <iwxxm:TAF> extension element.

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ATTRIBUTES

amendableTAFParameter: **AmendableTAFParameter** type
Multiplicity: [1..4]

List of weather parameters that can be amended.

Properties:
sequenceNumber = 1

periodOfLimitation: **TM_Period** type

Time period when amendments are unavailable.

Properties:
sequenceNumber = 2

SAMPLE INSTANCES

Description	XML Fragment
Amendments will be limited to ceilings, visibilities from 04/1728Z to 04/2200Z	<iwxxm-us:TAFAmendmentLimitations> <iwxxm-us:amendableTAFParameter xlink:href="http://nws.weather.gov/codes/NWSI10-813/2012/AmendableTAFParameter/CEILING/" xlink:title="Amendments based on cloud ceilings will be issued"/> <iwxxm-us:amendableTAFParameter xlink:href="http://nws.weather.gov/codes/NWSI10-813/2012/AmendableTAFParameter/VISIBILITY/" xlink:title="Amendments based on horizontal visibility will be issued"/> <iwxxm-us:periodOfLimitation gml:id="uuid.2c09a783-ff74-4780-9b35-3d1ce7472065"> <gml:beginPosition>2019-06-04T17:28:00Z</gml:beginPosition> <gml:endPosition>2019-06-04T22:00:00Z</gml:endPosition> </iwxxm-us:periodOfLimitation> </iwxxm-us:TAFAmendmentLimitations>
No amendments will be issued from 02/0800Z to 02/1200Z	<iwxxm-us:TAFAmendmentLimitations> <iwxxm-us:amendableTAFParameter xlink:href="http://nws.weather.gov/codes/NWSI10-813/2012/AmendableTAFParameter/NONE" xlink:title="No amendments will be issued"/> <iwxxm-us:periodOfLimitation gml:id="uuid.2c09a783-ff74-4780-9b35-3d1ce7472065"> <gml:beginPosition>2021-04-02T08:00:00Z</gml:beginPosition> <gml:endPosition>2021-04-02T12:00:00Z</gml:endPosition> </iwxxm-us:periodOfLimitation> </iwxxm-us:TAFAmendmentLimitations>

TurbulenceAboveAerodrome

Class «DataType»

A UML data type describing the expected location(s), type and severity of the turbulence above the aerodrome. This UML type is transformed into XML as a complex type, TurbulenceAboveAerodrome.

The TurbulenceAboveAerodrome complex type may appear in the <iwxxm-us:MeteorologicalAerodromeForecastExtension]> element.

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ATTRIBUTES

turbulenceIntensity: **TurbulenceIntensity** type

Character and intensity of forecasted turbulence.

Properties:
sequenceNumber = 1

layerAboveAerodrome: **LayerAboveAerodrome** type

Vertical extent of turbulence above the aerodrome.

Properties:
sequenceNumber = 2

SAMPLE INSTANCES

Description	XML Fragment
Forecast occasional moderate clear-air turbulence from 35 to 50 thousand feet	<iwxxm-us:TurbulenceAboveAerodrome> <iwxxm-us:turbulenceIntensity xlink:href="https://codes.nws.noaa.gov/AFMAN/15-124/TurbulenceIntensity/2"/> <iwxxm-us:layerAboveAerodrome> <iwxxm-us:lowerLimit uom="[ft_i]">35000</iwxxm-us:lowerLimit> <iwxxm-us:upperLimit uom="[ft_i]">50000</iwxxm-us:upperLimit> </iwxxm-us:layerAboveAerodrome> </iwxxm-us:TurbulenceAboveAerodrome>

AirFrameIcingIntensity

Class «CodeList»

Air Force Manual 15-124 on airframe icing intensity refer to WMO BUFR4 table.

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CODE LIST ATTRIBUTES	
asDictionary	true
extensibility	none
vocabulary	https://codes.nws.noaa.gov/AFMAN/15-124/IcingType

AmendableTAFParameter

Class «CodeList»

List of meteorological parameters that will be monitored and updated with amendments.

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CODE LIST ATTRIBUTES	
asDictionary	true
extensibility	none
vocabulary	https://codes.nws.noaa.gov/NWSI-10-813/AmendableTAFParameter

TurbulenceIntensity

Class «CodeList»

AFMAN 15-124 Table 1.7 lists the allowable turbulence intensity and type.

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CODE LIST ATTRIBUTES	
asDictionary	true
extensibility	none
vocabulary	https://codes.nws.noaa.gov/AFMAN/15-124/TurbulenceIntensity

Glossary of Externally Defined Data Types

UML Name	XML Data Type
Angle	gml:AngleType
Boolean	xsd:boolean
boolean	xsd:boolean
CharacterString	xsd:string
Distance	gml:LengthType
duration	xsd:duration
GM_LineString	gml:LineStringSegmentType
GM_Point	gml:PointPropertyType
GM_Reference	gml:ReferenceType
Length	gml:LengthType
Measure	gml:Measure
TM_Instant	gml:TimeInstantPropertyType
TM_Period	gml:TimePeriodPropertyType
TM_Primitive	gml:TimePrimitivePropertyType
Velocity	gml:SpeedType