OntoDiff: rsm12e vs rsm12

==== === === [ OntoRail Diff ] === === ====
 • target: rsm12e (http://ontorail.org/src/RSM/rsm12e/)
 • versus: rsm12 (http://ontorail.org/src/RSM/rsm12/)
 • entity types considered: ['Package', 'Object', 'Property', 'Enumeration']
 • performed: 2023-02-17 13:51:31 +0000
 • duration: 13.6 sec
 • OntoDiff version date: 2023-02-17 12:04:28
 • Ignored predicates: xmi:ea\_localid, xmi:lowerValue\_\_id, xmi:upperValue\_\_id, xmi:source\_\_isNavigable, xmi:coords\_\_ordered, xmi:coords\_\_scale, xmi:containment\_\_position, xmi:virtualInheritance, xmi:target\_\_isNavigable, xmi:source\_\_idref, xmi:target\_\_idref, xmi:type\_\_idref, xmi:labels\_\_rb, xmi:type, xmi:visibility, xmi:isUnique, xmi:upperValue\_\_type, xmi:isDerived, xmi:isDerivedUnion, xmi:isOrdered, xmi:isReadOnly, xmi:isStatic
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# Summary

## Package entities

### 37 Package in rsm12e:

Base, Calendar, CapacityAllocation, CommercialOperations, Common, EA\_C#\_Types\_Package, EA\_Java\_Types\_Package, EA\_PrimitiveTypes\_Package, EA\_Python\_Types\_Package, Energy, Energy\_SCADA, Energy\_distribution, Environment, "General documentation", Geometry, Infrastructure, LegalEntities, Location, NetEntity, NetProperty, Network, ObservationAndMeasure, Operations, OperationsEntity, Positioning, RSM, RailwayStakeholders, RollingStock, RootPackage, Signalling, TimeAxis, Topology, Track, Train, TrainOperations, TrainRouting, Weather

### 10 Package NEW from rsm12:

Calendar, CapacityAllocation, CommercialOperations, Operations, OperationsEntity, RailwayStakeholders, RollingStock, Train, TrainOperations, TrainRouting

### 1 Package REMOVED from rsm12:

RSM\_1.2

### 22 Package MODIFIED from rsm12:

Base, Common, Energy, Energy\_SCADA, Energy\_distribution, Environment, "General documentation", Geometry, Infrastructure, LegalEntities, Location, NetEntity, NetProperty, Network, ObservationAndMeasure, Positioning, RSM, Signalling, TimeAxis, Topology, Track, Weather

## Object entities

### 254 Object in rsm12e:

$inet://https://www.w3.org/TR/vocab-ssn/#Observations, Air, AirTemperature, AlignmentCantSegment, AlignmentCurve, AnchorPoint, Angle, Anywhere, ApplicationRange, AreaLocation, AssociatedNetElement, AssociatedPositioning, BaseLocation, BaseObject, BaseProperty, Calendar, CalendarDay, Cant, Canvas, CartesianCoordinate, CircularTurnout, Circulation, Circumstance, CompanyCode, CompositeSource, CompositeTimeInterval, CompositionNetElement, Connection, Context, ControlAssignment, Country, Crossing, DailyTrain, Date, DateTimeDescription, DilatationPanel, Dimensionless, DiscretisedPoint, DiscretisedPointSet, DistributionFunctionalEntity, DoubleSlipCrossing, Duration, DurationOfSunshine, ETCSoperationalTrainCategory, ElementLength, ElementPartCollection, ElementarySection, ElementarySource, Elevation, ElevationAndInclination, EmptyPeriod, EnergyEntity, Entity, Fleet, Formation, FormationType, FreightEntity, GeneralDateTimeDescription, GeodeticReferenceSystem, GeographicCoordinate, GeographicCoordinateSystem, GeometricCoordinate, GeopoliticalEntity, Gradient, GridReferenceSystem, Ground, Halt, HorizontalAlignment, HorizontalAlignmentSegment, HorizontalSegmentArc, HorizontalSegmentLine, HorizontalSegmentTransition, HumidityMixingRatio, Inertia, InformationSource, InfrastructureManagerActivity, Instant, Interval, IntrinsicCoordinate, "Issue: TAF XSD does not seem to follow TAF TSI definitions regarding responsible applicant", JunctionEntity, LateralDistance, LateralInclination, LateralPosition, LateralSide, LegalPerson, Length, LineString, LinearCoordinate, LinearElement, LinearElementWithLength, LinearLocation, LinearPositioningSystem, LinearTrainJourneyLocation, "List of Elements in Package Train", LocatedNetEntity, LocatedOperationsEntity, LocationCodes, LocationPoint, LocationsSet, MarkerPoint, Mass, MeasurementAuthor, MeasurementEquipment, MeasurementMethod, Medium, NamedLine, NamedResource, NamedTrack, NetElement, NetEntity, NetProperty, Network, NetworkAccessPoint, NetworkFrontierPoint, NetworkLevel, NetworkResource, NeutralSection, NonLinearElement, NonlinearTrainJourneyLocation, Nowhere, NumericQuantity, ObservableProperty, Observation, OfftrackEntity, OnTrackSignallingDevice, OntrackEntity, OperationalPoint, OperationsEntity, OrderedCollection, OrganizationCode, OrientedRollingStock, PassengerEntity, Path, PathRequest, PhenomenonTime, PhysicalAddress, PlannedCalendar, PlannedJourneyLocation, PlannedTrain, Point, Polygon, PositionedRelation, PositioningNetElement, PositioningSystem, PositioningSystemCoordinate, PowerSupplyFacilitySpatialStructure, Precipitation, Prediction, ProjectedLength, PropertySet, Quantity, QuantityKind, RailwayActivity, RailwayAlignmentCant, RailwayDiscretisedPoint, RailwayStakeholder, Rainfall, ReferenceCalendar, Relation, RelativeHumidity, RemoteInstant, RequestedCalendar, Requirement, Requirement, RollingStock, RollingStockEntity, RollingStockModel, RollingStockType, RootObject, RouteBody, RoutePoint, RouteSection, RunningTrain, SCADA\_center, SCADA\_configuration, Scale, ScaleValueDefinition, SecantTurnout, SectioningPost, Sector, SegmentCantLine, SegmentCantTransition, Sensor, ShuntingMovement, Signal, SimpleCrossing, SimpleTimeInterval, SingleSlipCrossing, Snowfall, SpecialTurnout, Speed, SpotLocation, StateBorder, Station, StoppingPattern, SubCalendar, SubSector, Substation, SubstationOutput, Surface, SwitchingPost, TangentTurnout, Temperature, TemporalEntity, TemporalPosition, ThicknessOfRainfallAmount, ThicknessOfSnowfallAmount, ThreeDAlignmentCurve, ThreeDLength, TimePosition, TimeReferenceSystem, TimedLocation, Timetable, TimingAtLocation, TownOffice, TpsDevice, TrackPanel, TractionPost, Train, TrainActivity, TrainCategory, TrainComposition, TrainLine, TrainRoute, TrainRouteElement, TrainSchedule, TrapPoint, Trip, Turnout, UndefinedInstant, Unit, UnitIdentification, UnorderedCollection, ValidityPeriod, Vehicle, VehiclePassageDetector, VehicleStop, VehicleType, VerticalAlignment, VerticalAlignmentSegment, VerticalSegmentArc, VerticalSegmentLine, VerticalSegmentTransition, Warehouse, WeatherFeature, WeatherProperty, Wind, WindFromDirection, WindSpeed, https://en.wikipedia.org/wiki/Line\_graph, https://gssc.esa.int/navipedia/index.php/Time\_References\_in\_GNSS, sysml\_qudv:annex\_c.5\_2009-08-26.pdf, tID

### 76 Object NEW from rsm12:

Calendar, CalendarDay, Circulation, CompanyCode, DailyTrain, Date, ETCSoperationalTrainCategory, Fleet, Formation, FormationType, FreightEntity, Halt, InfrastructureManagerActivity, "Issue: TAF XSD does not seem to follow TAF TSI definitions regarding responsible applicant", LateralDistance, LateralPosition, LateralSide, LinearTrainJourneyLocation, "List of Elements in Package Train", LocatedOperationsEntity, LocationCodes, LocationPoint, MarkerPoint, NamedLine, NamedTrack, NetworkAccessPoint, NetworkFrontierPoint, NonlinearTrainJourneyLocation, OfftrackEntity, OntrackEntity, OperationalPoint, OperationsEntity, OrganizationCode, OrientedRollingStock, PassengerEntity, Path, PathRequest, PlannedCalendar, PlannedJourneyLocation, PlannedTrain, Point, ProjectedLength, RailwayActivity, RailwayStakeholder, ReferenceCalendar, RequestedCalendar, Requirement, RollingStock, RollingStockEntity, RollingStockModel, RollingStockType, RoutePoint, RouteSection, RunningTrain, ShuntingMovement, StateBorder, Station, StoppingPattern, SubCalendar, ThreeDLength, Timetable, TimingAtLocation, TownOffice, Train, TrainActivity, TrainCategory, TrainComposition, TrainLine, TrainRoute, TrainRouteElement, TrainSchedule, Trip, UnitIdentification, Vehicle, VehicleType, Warehouse

### 1 Object REMOVED from rsm12:

TransitionShape

### 2 Object with a changed IRI from rsm12:

Label:"Date" : IRI changed from rsm12:EAID\_F46B60E1\_60B5\_4e7d\_BEC0\_ABA810DC44A9 to rsm12e:EAID\_9F289EDE\_E096\_43f4\_B045\_02BA74467111, Label:"Infrastructure" : IRI changed from rsm12:EAID\_8B1A8F8B\_B0AF\_4bff\_968A\_C25F21A610CD to rsm12e:EAPK\_D8F1DD20\_EC06\_4e08\_888C\_0D8A471C8E4A

### 17 Object MODIFIED from rsm12:

AlignmentCantSegment, AnchorPoint, AssociatedNetElement, BaseLocation, Cant, DistributionFunctionalEntity, Gradient, HorizontalSegmentTransition, LineString, LinearCoordinate, LinearLocation, LinearPositioningSystem, NetProperty, NumericQuantity, Polygon, SpotLocation, TimedLocation

## Property entities

### 303 Property in rsm12e:

Alpha2code, "Anonymous Aggreg.", "Anonymous Aggreg.", EVN, FixedFormation, activityTimeInterval, activityType, actualRoute, appliesInDirection, appliesTo, appliesTo, appliesTo, appliesTo, appliesTo, appliesTo, appliesTo, appliesTo, appliesTo, appliesTo, appliesTo, arrivalTrack, assignments, associatedNetElements, associatedNetElements, associatedNetElements, associatedPositioning, atTime, belongsToSector, bounds, calendarDay, calendarDay, calendarDays, carriesLiveStockOrPeople, code\_value, code\_value, companyCode, composition, connects, considers, containsTypes, controlCenter, controlsPosts, controlsSubstations, coordinates, coordinates, coordinates, coordinates, coordinates, coordinatingIM, country, crossingArea, crossingCentre, dailyTrain, dailyTrainId, datumSource, definition, definitionURI, definitionURI, departureTrack, description, description, designation, distance, dwellTime, elementA, elementB, elementCollections, elementLength, elementParts, elementParts, elevation, end, endAzimuth, endIncluded, endMeasure, epsgCode, etcsCategory, featureOfInterest, finalElevation, finalRadius, finalRadius, foreseenRoute, freightFunction, fromObservation, fulfillsRequirements, fullAssembledPath, handles, hasAddress, hasCircumstances, hasCoordinateReferenceSystem, hasCountry, hasDescriptionLevel, hasDuration, hasFinalCant, hasForecasts, hasHorizontalAlignment, hasInitialCant, hasLateralInclination, hasLateralPosition, hasLinearLocation, hasLinearLocation, hasLinearLocation, hasLinearLocation, hasOutputs, hasSections, hasSource, hasSources, hasSpotLocation, hasTRS, hasTimedLocations, hasTransitionCurve, hasValues, hasVerticalAlignment, has\_name, height, id, id, inclination, inclination, includesTurnouts, includesTurnouts, initialAzimuth, initialElevation, initialRadius, initialRadius, intermediatePoints, intervalComponents, intrinsicCoordinates, isCurved, isDeadRun, isDescribedWithPoints, isEntry, isExit, isHandlingPoint, isLocatedAt, isLocatedAt, isLocatedAt, isLocatedAt, isLocatedAt, isPartOf, isReportingPoint, isSmoothed, isStoppingPoint, isStructuredIn, isStructuredIn, isStructuredIn, isSubsetOf, isTimingPoint, journeyLocationType, journeyLocations, lateralOffset, latitude, leadRU, leadsTowards, length, length, length, levels, linearReferencingMethodType, linestrings, locatedAt, location, locationCodes, locations, locations, longitude, madeBySensor, mainCategory, manages, managesNetworks, manufacturedBy, measure, measureFromPrevious, name, navigability, netElement, networkResources, networkResources, observedProperty, ofModel, ofTypes, offsetToReference, operatedBy, operationalTrainNumber, organizationCode, orientation, orientation, orients, origin, overInterval, ownedBy, partOfFleet, partitionsCalendar, path, permittedSpeed, plannedCalendar, plannedRoute, plannedTrain, plannedTrainId, points, points, pointsAt, polygons, positionOnA, positionOnB, positioningSystem, positioningSystem, primaryLocationCode, primaryLocationName, quantifies, quantity, quantity, quantity, quantity, quantity, quantity, quantity, quantityKind, radius, radius, radius, railwayActivity, reference, referenceCalendar, referenceDatabase, referenceTrainId, refersToPrevious, requestedCalendar, requiresConsist, responsibleApplicant, responsibleIM, responsibleRU, responsibleRU, restartValue, routeSection, routeSectionDestination, routeSectionOrigin, routeSections, satisfiesRequirements, scale, secantAngle, sequence, serviceTrack, setsQuantity, side, simpleResult, start, startIncluded, startMeasure, stoppingPattern, stops, subCategory, subModelOf, subsidiaryLocationCode, superelevation, symbol, symbol, temporalPosition, time, timingAtLocation, timingQualifier, train, trainActivities, trainActivityType, trainCategory, trainDestination, trainOrigin, trainRoute, trainStatus, transitionType, transitionType, transitionType, turningAngle, turnoutArea, type, type, type, typeDesignations, typeDesignations, unit, unit, unitIdentification, units, usesAnchorPoint, validIn, validityPeriod, validityPeriod, validityPeriod, validityPeriod, validityPeriod, value, value, value, value, value, value, value, valueDefinition, verticalOffset, width, x, y, z

### 120 Property NEW from rsm12:

"Anonymous Aggreg.", "Anonymous Aggreg.", EVN, FixedFormation, activityTimeInterval, activityType, actualRoute, arrivalTrack, calendarDay, calendarDay, calendarDays, carriesLiveStockOrPeople, code\_value, code\_value, companyCode, composition, containsTypes, coordinates, coordinates, coordinatingIM, country, dailyTrain, dailyTrainId, datumSource, departureTrack, designation, distance, dwellTime, etcsCategory, foreseenRoute, freightFunction, fulfillsRequirements, fullAssembledPath, hasTimedLocations, intermediatePoints, isDeadRun, isEntry, isExit, isHandlingPoint, isLocatedAt, isReportingPoint, isStoppingPoint, isTimingPoint, journeyLocationType, journeyLocations, leadRU, length, linestrings, locatedAt, location, locationCodes, mainCategory, managesNetworks, manufacturedBy, name, ofModel, ofTypes, offsetToReference, operatedBy, operationalTrainNumber, organizationCode, orientation, orients, ownedBy, partOfFleet, partitionsCalendar, path, plannedCalendar, plannedRoute, plannedTrain, plannedTrainId, points, points, polygons, primaryLocationCode, primaryLocationName, railwayActivity, referenceCalendar, referenceDatabase, referenceTrainId, requestedCalendar, requiresConsist, responsibleApplicant, responsibleIM, responsibleRU, responsibleRU, restartValue, routeSection, routeSectionDestination, routeSectionOrigin, routeSections, satisfiesRequirements, serviceTrack, side, stoppingPattern, stops, subCategory, subModelOf, subsidiaryLocationCode, time, timingAtLocation, timingQualifier, train, trainActivities, trainActivityType, trainCategory, trainDestination, trainOrigin, trainRoute, trainStatus, transitionType, transitionType, type, type, type, typeDesignations, typeDesignations, unitIdentification, units, validityPeriod

### 6 Property REMOVED from rsm12:

hasProperty, isOfTransitionType, longname, observes, perimeters, polyLines

### 3 Property with a changed IRI from rsm12:

Label:"name" : IRI changed from rsm12:EAID\_080C70AE\_7680\_4515\_B580\_0B30E8066364 to rsm12e:EAID\_EE1E40BA\_91F2\_49a5\_83DC\_603CB6D62B8D, Label:"type" : IRI changed from rsm12:EAID\_A66530DB\_CE98\_41b7\_B273\_C4B5B114CAB5 to rsm12e:EAID\_3820BA8A\_4F57\_4897\_B042\_1B21339B1EC4, Label:"type" : IRI changed from rsm12:EAID\_1BA7CCE7\_A6A6\_42f9\_9ACD\_1222442810C9 to rsm12e:EAID\_3820BA8A\_4F57\_4897\_B042\_1B21339B1EC4

### 49 Property MODIFIED from rsm12:

Alpha2code, appliesTo, associatedNetElements, coordinates, definition, definitionURI, definitionURI, description, description, elevation, endIncluded, hasForecasts, hasLateralPosition, hasTransitionCurve, has\_name, id, intervalComponents, isCurved, isDescribedWithPoints, isStructuredIn, isStructuredIn, isStructuredIn, latitude, linearReferencingMethodType, longitude, measureFromPrevious, positioningSystem, quantity, quantity, quantity, quantity, quantity, quantity, quantity, reference, setsQuantity, simpleResult, startIncluded, superelevation, symbol, symbol, transitionType, value, value, value, value, value, value, z

## Enumeration entities

### 20 Enumeration in rsm12e:

ApplicationDirection, DescriptionLevel, FormationTypeDesignation, FreightFunction, HorizontalTransitionType, JourneyLocationTypeCode, LRMType, LeftRight, Navigability, RailwayActivityType, ReferenceDatabase, RollingStockOrientation, Side, TimingQualifierCode, TrainStatus, TransitionTypes, TurnoutOrientation, Usage, VehicleTypeDesignation, VerticalTransitionType

### 11 Enumeration NEW from rsm12:

FormationTypeDesignation, FreightFunction, HorizontalTransitionType, JourneyLocationTypeCode, RailwayActivityType, ReferenceDatabase, RollingStockOrientation, TimingQualifierCode, TrainStatus, VehicleTypeDesignation, VerticalTransitionType

### 1 Enumeration REMOVED from rsm12:

Orientation

### 4 Enumeration MODIFIED from rsm12:

ApplicationDirection, LRMType, Side, TransitionTypes

# Modified Entities

## Package entities

### ontorail:Package rsm12e:Base modifications from rsm12:

 == ontorail:hasAssociation => ++ :"datumSource", ++ :"distance", ++ :"dwellTime", :"elementLength", :"endAzimuth", :"endMeasure", :"featureOfInterest", :"finalRadius", ++ :"fromObservation", :"hasDuration", :"hasForecasts", :"hasValues", :"height", :"id", :"inclination", :"initialAzimuth", :"initialRadius", ++ :"isPartOf", :"lateralOffset", :"length", :"measure", :"measureFromPrevious", :"observedProperty", :"permittedSpeed", :"quantifies", :"quantity", :"quantityKind", :"radius", ++ :"restartValue", :"scale", :"secantAngle", :"setByRequirement", :"startMeasure", :"superelevation", :"turningAngle", :"unit", ++ :"units", :"valueDefinition", :"verticalOffset", :"width", -- :"Anonymous Aggreg.", -- :"Anonymous Asso.", -- :"contains", -- :"hasProperty", -- :"hasResults", -- :"observes", -- :"quantiy"

 == rdfs:comment => "Object identity, properties, quantity, value and units", -- "Associates a context-free quantity to an observable property. While possible, we advise users to use quantifications associated with a context and validity: see Observation package."

### ontorail:Package rsm12e:Common modifications from rsm12:

 == ontorail:subPackageOf => ++ :"RSM", -- :"RSM\_1.2"

### ontorail:Package rsm12e:Energy modifications from rsm12:

 ++ rdfs:comment => "Packages for HV energy distribution and SCADA"

### ontorail:Package rsm12e:Energy\_SCADA modifications from rsm12:

 == ontorail:hasAssociation => :"assignments", :"controlCenter", -- :"controlsPosts", -- :"controlsSubstations"

 -- onto:infoURL => "EA1/EA3/EA4/EA2/EA941.htm"

### ontorail:Package rsm12e:Energy\_distribution modifications from rsm12:

 == ontorail:hasAssociation => :"belongsToSector", ++ :"controlsPosts", ++ :"controlsSubstations", ++ :"ends", :"hasOutputs", :"hasSections", :"manages", -- :"connects"

 -- onto:infoURL => "EA1/EA3/EA4/EA1/EA913.htm"

### ontorail:Package rsm12e:Environment modifications from rsm12:

 == ontorail:subPackageOf => ++ :"RSM", -- :"RSM\_1.2"

 ++ rdfs:comment => "Non-railway specific domains"

 == xmi:tpos => ++ "3", -- "4"

### ontorail:Package rsm12e:"General documentation" modifications from rsm12:

 == ontorail:subPackageOf => ++ :"RSM", -- :"RSM\_1.2"

### ontorail:Package rsm12e:Geometry modifications from rsm12:

 == ontorail:hasAssociation => :"finalElevation", :"hasFinalCant", :"hasHorizontalAlignment", :"hasInitialCant", :"hasLateralInclination", :"hasVerticalAlignment", :"initialElevation", :"isDescribedWithPoints", :"isSmoothed", :"isStructuredIn", :"isSubsetOf", ++ :"transitionType", -- :"Anonymous Aggreg.", -- :"Anonymous Asso.", -- :"isOfTransitionType", -- :"transitionShape"

 == ontorail:hasEnumeration => ++ :"HorizontalTransitionType", :"TransitionTypes", ++ :"VerticalTransitionType"

### ontorail:Package rsm12e:Infrastructure modifications from rsm12:

 == ontorail:subPackageOf => ++ :"RSM", -- :"RSM\_1.2"

 == xmi:tpos => ++ "4", -- "3"

### ontorail:Package rsm12e:LegalEntities modifications from rsm12:

 == ontorail:hasAssociation => ++ :"country", :"hasAddress", :"hasCountry"

 -- onto:infoURL => "EA1/EA4/EA1/EA954.htm"

### ontorail:Package rsm12e:Location modifications from rsm12:

 == ontorail:hasAssociation => :"appliesInDirection", :"associatedNetElements", :"atTime", :"crossingArea", :"crossingCentre", ++ :"hasLateralPosition", :"hasLinearLocation", :"hasSpotLocation", ++ :"hasTimedLocations", :"isLocatedAt", ++ :"locatedAt", :"locations", :"origin", :"pointsAt", ++ :"side", :"turnoutArea", -- :"Anonymous Aggreg.", -- :"Anonymous Asso.", -- :"isLocatedToSide"

 == ontorail:hasEnumeration => :"ApplicationDirection", ++ :"Side", -- :"LateralSide"

 -- onto:infoURL => "EA1/EA2/EA5/EA410.htm"

### ontorail:Package rsm12e:NetEntity modifications from rsm12:

 -- onto:infoURL => "EA1/EA3/EA1/EA759.htm"

### ontorail:Package rsm12e:NetProperty modifications from rsm12:

 -- onto:infoURL => "EA1/EA2/EA8/EA673.htm"

### ontorail:Package rsm12e:Network modifications from rsm12:

 == ontorail:hasAssociation => :"considers", :"hasDescriptionLevel", :"levels", ++ :"managesNetworks", :"networkResources", :"validityPeriod"

 -- onto:infoURL => "EA1/EA2/EA3/EA289.htm"

### ontorail:Package rsm12e:ObservationAndMeasure modifications from rsm12:

 == ontorail:hasAssociation => :"Anonymous Asso.", :"featureOfInterest", ++ :"fulfillsRequirements", :"hasCircumstances", :"hasRequirements", :"hasSource", :"hasSources", :"madeBySensor", :"observableProperty", ++ :"satisfiesRequirements", :"validIn"

 == rdfs:comment => "Provides observations, measurements, sensors", -- "inherited, but not used"

 -- onto:infoURL => "EA1/EA2/EA7/EA609.htm"

### ontorail:Package rsm12e:Positioning modifications from rsm12:

 == ontorail:hasAssociation => :"appliesTo", :"bounds", :"coordinates", :"hasCoordinateReferenceSystem", :"intrinsicCoordinates", :"isLocatedAt", ++ :"linearReferencingMethodType", ++ :"linestrings", ++ :"points", ++ :"polygons", :"positioningSystem", :"refersToPrevious", :"usesAnchorPoint", :"validityPeriod", -- :"Anonymous Aggreg.", -- :"Anonymous Asso.", -- :"hasLinearReferencingMethod", -- :"perimeters", -- :"polyLines"

 == ontorail:hasEnumeration => ++ :"LRMType", -- :"LrMethod"

 -- onto:infoURL => "EA1/EA2/EA4/EA323.htm"

### ontorail:Package rsm12e:RSM modifications from rsm12:

 == rdfs:comment => ++ "RSM 2022-06, continuation of RSM 1.2.\n\nThis is a beta version.", -- "Baselines of the RSM 1.2 version released on internet in Decembre 2021."

 == rdfs:label => ++ "RSM", -- "RSM\_1.2"

 == xmi:package => ++ "EAPK\_651A1F86\_4D98\_4ba2\_8DD3\_F753F7C24BD6", -- "EAPK\_54BC8251\_EF8C\_4733\_A536\_B0CA519A7292"

 -- ontorail:subPackageOf => :"RSM\_1.2"

### ontorail:Package rsm12e:Signalling modifications from rsm12:

 -- onto:infoURL => "EA1/EA3/EA3/EA890.htm"

 -- ontorail:hasAssociation => :"Anonymous Aggreg.", :"Anonymous Asso."

### ontorail:Package rsm12e:TimeAxis modifications from rsm12:

 == ontorail:hasAssociation => ++ :"activityTimeInterval", :"end", :"hasTRS", :"intervalComponents", :"overInterval", :"start", :"temporalPosition", ++ :"time", :"validityPeriod", -- :"Anonymous Aggreg.", -- :"Anonymous Asso."

 -- onto:infoURL => "EA1/EA2/EA9/EA699.htm"

### ontorail:Package rsm12e:Topology modifications from rsm12:

 == ontorail:hasAssociation => :"associatedPositioning", :"elementA", :"elementB", :"elementCollections", :"elementParts", :"handles", :"leadsTowards", :"navigability", :"netElement", :"positionOnA", :"positionOnB", -- :"Anonymous Aggreg.", -- :"Anonymous Asso."

 == ontorail:hasEnumeration => :"LeftRight", :"Navigability", :"Usage", -- :"Orientation"

### ontorail:Package rsm12e:Track modifications from rsm12:

 == ontorail:hasAssociation => :"includesTurnouts", :"orientation", -- :"Anonymous Aggreg.", -- :"Anonymous Asso."

 -- onto:infoURL => "EA1/EA3/EA2/EA774.htm"

### ontorail:Package rsm12e:Weather modifications from rsm12:

 == ontorail:hasAssociation => :"appliesTo", -- :"plliesTo"

 -- onto:infoURL => "EA1/EA4/EA2/EA972.htm"

## Object entities

### ontorail:Object rsm12e:AlignmentCantSegment modifications from rsm12:

 == xmi:isAbstract => ++ "true", -- "false"

### ontorail:Object rsm12e:AnchorPoint modifications from rsm12:

 == rdfs:comment => ++ """ ISO19148:2012 : LR\_AlongReferent ; ISO19148:2021: Referent, of type "referenceMarker" that is implicit in RSM. """, -- "ISO19148:2012 : LR\_AlongReferent.\n\nattributes (or references to) measure, and measure from previous (or: to next), are not needed, because anchor points, being spot locations, are expected to be provided with coordinates."

### ontorail:Object rsm12e:AssociatedNetElement modifications from rsm12:

 == rdfs:comment => ++ "Associates a location to an element of the topology, via (at most) two extremities located on this element. ", ++ "Associates a location to an element of the topology, via (at most) two extremities located on this element.", -- "Associates a location to an element of the topology. ", -- "Associates a location to an element of the topology."

### ontorail:Object rsm12e:BaseLocation modifications from rsm12:

 == xmi:tpos => ++ "3", -- "5"

### ontorail:Object rsm12e:Cant modifications from rsm12:

 ++ xmi:tag\_\_Source => "RSM"

### ontorail:Object rsm12e:DistributionFunctionalEntity modifications from rsm12:

 == rdfs:comment => ++ """ A superclass for all electrically (conductively) continuous parts of the railway traction energy network. We do not consider here:\n<ul>\n <li>the input (HV) side of substations</li>\n <li>all parts "downstream" of the overhead contact line, e.g. traction current return circuits.</li>\n</ul> """, """ New classes, providing an "electrical topology" for the traction power distribution """, -- """ A superclass for all electrically (conductively) continuous parts of the railway traction energy network. We do not consider here:\n<ul>\n <li>the input (HV) side of substations</li>\n <li>all parts "downstream" of the overhead contact line, e.g. traction current return circuits.</li>\n</ul> """

### ontorail:Object rsm12e:Gradient modifications from rsm12:

 == rdfs:comment => ++ "Quantity of type gradient, slope, ramp, inclination expressed as the tangent of rise/fall over distance. \nUphill is positive, downhill is negative.\nValue in decimal form, not % or &#176;/&#176;&#176;", -- "Quantity of type gradient, slope, ramp, inclination expressed as the tangent of rise/fall over distance. \nUphill is positive, downhill is negative."

### ontorail:Object rsm12e:HorizontalSegmentTransition modifications from rsm12:

 == rdfs:comment => ++ "Geometric primitive for a horizontal transition curve. May be specialised to represent various types of transition curves and their associated parameters. ", ++ "Geometric primitive for a horizontal transition curve. May be specialised to represent various types of transition curves and their associated parameters.", -- "Geometric primitive for a transition curves. May be specialised to represent various types of transition curves and their associated parameters. ", -- "Geometric primitive for a transition curves. May be specialised to represent various types of transition curves and their associated parameters."

### ontorail:Object rsm12e:LineString modifications from rsm12:

 == rdfs:comment => ++ """ Set of consecutive straight segments (no branches) defined by successive vertices. Can be specialized to e.g. prisms, for instance to define 3D "areas". """, -- """ Set of consecutive straight segments (no branches) defined by successive coordinates. Can be specialized to e.g. prisms, for instance to define 3D "areas". """

 == rdfs:label => ++ "LineString", -- "PolyLine"

 ++ rdfs:subClassOf => :"NamedResource"

 ++ xmi:tag\_\_hasPublicDefinition => "http://data.ign.fr/def/geometrie/20190212.htm#LineString"

### ontorail:Object rsm12e:LinearCoordinate modifications from rsm12:

 == rdfs:comment => ++ """ A curvilinear abscissa ("distance along"), optionally with vertical and lateral offset. The units are defined by the associated positioning system.\nSee also ISO19148:2012: LR\_PositionExpression.\nPlease note that the concepts match: in ISO19148, LR\_PositionExpression refers to exactly 1 distance expression (here: instance of Length), one linear element (here: one reference line, via the reference to positioning system), and one linear referencing method (here: referred to, via the linear positioning system). """, -- """ A curvilinear abscissa ("distance along"), optionally with vertical and lateral offset.\nThe units are defined by the associated positioning system.\n\nISO19148:2012: LR\_PositionExpression.\nPlease note that the concepts match: in ISO19148, LR\_PositionExpression refers to exactly 1 distance expression (here: instance of Length), one linear element (here: one reference line, via the reference to positioning system), and one linear referencing method (here: referred to via the linear positioning system). """

### ontorail:Object rsm12e:LinearLocation modifications from rsm12:

 == xmi:tpos => ++ "5", -- "6"

### ontorail:Object rsm12e:LinearPositioningSystem modifications from rsm12:

 == rdfs:comment => ++ """ A referencing system for locations relative to a one-dimensional object (reference line) as measurement along (and optionally offset from) that object.\nA linear positioning system combines a line of reference (here: a collection of PositioningNetElements) with a single number (linear abscissa, i.e. an instance of class LinearCoordinate) allowing positioning within a railway network, at the chosen level (MACRO, MICRO...).\nOften called chainage (when yielding the actual "distance along"), or mileage system (when reflecting a conventional kilometric post or mile post system).\nThe start- and end-measures (optional) provide the valid range of linear coordinates within the chosen linear positioning system. The difference between two coordinates is not necessarily the "true distance along" because of possible deviations (jumps or systematic errors), that are taken care of by anchor points and linear referencing methods. \nThe units of linear abscissa are the same as the start and end-measure. \nFor reference, see EN 19148:2021. ISO parameter DistanceAlongDirection is "same", implicitly. """, -- """ A referencing system for locations relative to a one-dimensional object (reference line) as measurement along (and optionally offset from) that object. For reference, see EN 19148:2021.\n\nA linear positioning system combines a line of reference (here: a collection of PositioningNetElements) with a single number (linear abscissa, i.e. an instance of class LinearCoordinate) allowing positioning within a railway network, at the chosen level (MACRO, MICRO...).\n\nOften called chainage (when yielding the actual "distance along"), or mileage system (when reflecting a conventional kilometric post or mile post system).\n\nThe start- and end-measures (optional) provide the valid range of linear coordinates within the chosen linear positioning system. The difference between two coordinates is not necessarily the "true distance along" because of possible deviations (jumps or systematic errors), that are taken care of by anchor points and linear referencing methods. \nThe units of linear abscissa are the same as the start and end-measure. """, -- """ A referencing system for locations relative to a one-dimensional object (reference line) as measurement along (and optionally offset from) that object. For reference, see EN 19148:2021.\n\nA linear positioning system combines a line of reference (here: a collection of PositioningNetElements) with a single number (linear abscissa, i.e. an instance of class LinearCoordinate) allowing positioning within a railway network, at the chosen level (MACRO, MICRO...).\n\nOften called chainage (when yielding the actual "distance along"), or mileage system (when reflecting a conventional kilometric post or mile post system).\n\nThe start- and end-measures (optional) provide the valid range of linear coordinates within the chosen linear positioning system. The difference between two coordinates is not necessarily the "true distance along" because of possible deviations (jumps or systematic errors), that are taken care of by anchor points and linear referencing methods. \nThe units of linear abscissa are the same as the start and end-measure. """

### ontorail:Object rsm12e:NetProperty modifications from rsm12:

 == rdfs:subClassOf => ++ :"BaseProperty", -- :"BaseObject"

### ontorail:Object rsm12e:NumericQuantity modifications from rsm12:

 == rdfs:comment => ++ """ Any quantity that can be expressed with a number (cardinal or ordinal). For a more exhaustive list of subclasses, see "Common quantities" diagram. """, -- "Any quantity that can be expressed with a number (cardinal or ordinal)"

### ontorail:Object rsm12e:Polygon modifications from rsm12:

 == rdfs:comment => ++ """ A closed polyline without any intersections. The first and last vertex define the "closing" segment. """, -- """ A closed polyline without any intersections. The first and last coordinate define the "closing" segment. """

 == rdfs:subClassOf => ++ :"NamedResource", -- :"PolyLine"

### ontorail:Object rsm12e:SpotLocation modifications from rsm12:

 == xmi:tpos => ++ "6", -- "8"

### ontorail:Object rsm12e:TimedLocation modifications from rsm12:

 == xmi:tpos => ++ "7", -- "11"

## Property entities

### ontorail:Property rsm12e:Alpha2code modifications from rsm12:

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:appliesTo modifications from rsm12:

 == rdfs:label => ++ "appliesTo", -- "plliesTo"

 == xmi:labels\_\_rt => ++ "+appliesTo", -- "+plliesTo"

### ontorail:Property rsm12e:associatedNetElements modifications from rsm12:

 == xmi:labels\_\_lb => ++ "0..\*\n{ordered}", -- "0..\* {ordered}"

### ontorail:Property rsm12e:coordinates modifications from rsm12:

 == owl:minCardinality => ++ "0", -- "2"

 == rdfs:domain => ++ :"LineString", -- :"PolyLine"

 == xmi:lowerValue\_\_value => ++ "0", -- "2"

 == xmi:target\_\_type\_\_multiplicity => ++ "0..\*", -- "2..\*"

### ontorail:Property rsm12e:definition modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:definitionURI modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:definitionURI modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:description modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:description modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:elevation modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:endIncluded modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:hasForecasts modifications from rsm12:

 == xmi:labels\_\_lb => ++ "0..\*\n{ordered}", -- "0..\* {ordered}"

### ontorail:Property rsm12e:hasLateralPosition modifications from rsm12:

 == owl:minCardinality => ++ "0", -- "1"

 == rdfs:label => ++ "hasLateralPosition", -- "isLocatedToSide"

 == rdfs:range => ++ :"LateralPosition", -- :"LateralSide"

 == xmi:labels\_\_lb => ++ "0..1", -- "1"

 == xmi:labels\_\_lt => ++ "+hasLateralPosition", -- "+isLocatedToSide"

 == xmi:lowerValue\_\_value => ++ "0", -- "1"

 == xmi:source\_\_type\_\_multiplicity => ++ "0..1", -- "1"

### ontorail:Property rsm12e:hasTransitionCurve modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:has\_name modifications from rsm12:

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:id modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:intervalComponents modifications from rsm12:

 == xmi:labels\_\_lb => ++ "1..\*\n{ordered}", -- "1..\* {ordered}"

### ontorail:Property rsm12e:isCurved modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:isDescribedWithPoints modifications from rsm12:

 == xmi:labels\_\_lb => ++ "1..\*\n{ordered}", -- "1..\* {ordered}"

### ontorail:Property rsm12e:isStructuredIn modifications from rsm12:

 == xmi:labels\_\_lb => ++ "1..\*\n{ordered}", -- "1..\* {ordered}"

### ontorail:Property rsm12e:isStructuredIn modifications from rsm12:

 == xmi:labels\_\_lb => ++ "1..\*\n{ordered}", -- "1..\* {ordered}"

### ontorail:Property rsm12e:isStructuredIn modifications from rsm12:

 == xmi:labels\_\_lb => ++ "1..\*\n{ordered}", -- "1..\* {ordered}"

### ontorail:Property rsm12e:latitude modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:linearReferencingMethodType modifications from rsm12:

 == rdfs:label => ++ "linearReferencingMethodType", -- "hasLinearReferencingMethod"

 == rdfs:range => ++ :"LRMType", -- :"LrMethod"

 == xmi:labels\_\_lt => ++ "+linearReferencingMethodType", -- "+hasLinearReferencingMethod"

 ++ xmi:source\_\_documentation\_\_value => "see ISO 19148:2021"

### ontorail:Property rsm12e:longitude modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:measureFromPrevious modifications from rsm12:

 == owl:minCardinality => ++ "0", -- "1"

 == xmi:labels\_\_lb => ++ "0..1", -- "1"

 == xmi:lowerValue\_\_value => ++ "0", -- "1"

 == xmi:source\_\_type\_\_multiplicity => ++ "0..1", -- "1"

 -- rdfs:comment => "The distance measure is given with respect to this anchor point. If absent, the measure is counting from the origin of the LRS."

### ontorail:Property rsm12e:positioningSystem modifications from rsm12:

 == rdfs:comment => ++ "Linestring coordinates are expressed in <u>one </u>Positioning System. Define more linestrings if more positioning systems become relevant. May be left empty if linestring coordinates convey sufficient information about the positioning system.", -- "Polyline coordinates are expressed in <u>one </u>Positioning System. Define more polylines if more positioning systems become relevant. May be left empty if polyline coordinates convey sufficient information about the positioning system."

 == rdfs:domain => ++ :"LineString", -- :"PolyLine"

### ontorail:Property rsm12e:quantity modifications from rsm12:

 == xmi:labels\_\_lb => ++ "0..\*\n{ordered}", -- "0..\* {ordered}"

### ontorail:Property rsm12e:quantity modifications from rsm12:

 == xmi:labels\_\_lb => ++ "0..\*\n{ordered}", -- "0..\* {ordered}"

### ontorail:Property rsm12e:quantity modifications from rsm12:

 == rdfs:label => ++ "quantity", -- "quantiy"

 == xmi:labels\_\_lb => ++ "0..\*\n{ordered}", -- "0..\* {ordered}"

 == xmi:labels\_\_lt => ++ "+quantity", -- "+quantiy"

### ontorail:Property rsm12e:quantity modifications from rsm12:

 == xmi:labels\_\_lb => ++ "0..\*\n{ordered}", -- "0..\* {ordered}"

### ontorail:Property rsm12e:quantity modifications from rsm12:

 == xmi:labels\_\_lb => ++ "0..\*\n{ordered}", -- "0..\* {ordered}"

### ontorail:Property rsm12e:quantity modifications from rsm12:

 == xmi:labels\_\_lb => ++ "0..\*\n{ordered}", -- "0..\* {ordered}"

### ontorail:Property rsm12e:quantity modifications from rsm12:

 == xmi:labels\_\_lb => ++ "0..\*\n{ordered}", -- "0..\* {ordered}"

### ontorail:Property rsm12e:reference modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:setsQuantity modifications from rsm12:

 == xmi:labels\_\_lb => ++ "0..\*\n{ordered}", -- "0..\* {ordered}"

### ontorail:Property rsm12e:simpleResult modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:startIncluded modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:superelevation modifications from rsm12:

 == rdfs:comment => ++ "The height difference between the outer and inner rails in or in approach to a curve.\nThe value is normally positive. It is negative in the exceptional case when the inner rail is higher.\nCorresponds to IFC4.3 IfcAlignmentCant attribute RailHeadDistance.", -- "The height difference between the outer and inner rails in or in approach to a curve.\nPositive when the rotation is anti-clockwise (seen from above) with respect to the orientation of the linear element that carries the segment. "

 ++ xmi:tag\_\_seeAlso => """ http://ifc43-docs.standards.buildingsmart.org/IFC/RELEASE/IFC4x3/HTML/lexical/IfcAlignmentCant.htm, "RailHeadDistance" """

### ontorail:Property rsm12e:symbol modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:symbol modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:transitionType modifications from rsm12:

 == owl:minCardinality => ++ "0", -- "1"

 == rdfs:label => ++ "transitionType", -- "transitionShape"

 == rdfs:range => ++ :"TransitionTypes", -- :"TransitionShape"

 == xmi:labels\_\_lb => ++ "0..1", -- "1"

 == xmi:labels\_\_lt => ++ "+transitionType", -- "+transitionShape"

 == xmi:lowerValue\_\_value => ++ "0", -- "1"

 == xmi:source\_\_type\_\_multiplicity => ++ "0..1", -- "1"

### ontorail:Property rsm12e:value modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:value modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

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 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:value modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

### ontorail:Property rsm12e:z modifications from rsm12:

 -- xmi:derived => "0"

 -- xmi:length => "0"

 -- xmi:precision => "0"

## Enumeration entities

### ontorail:Enumeration rsm12e:ApplicationDirection modifications from rsm12:

 == xmi:tpos => ++ "10", -- "15"

### ontorail:Enumeration rsm12e:LRMType modifications from rsm12:

 == rdfs:comment => ++ "Linear Referencing Method Type ; values according to ISO 19148:2021 definitions.", -- "Linear Referencing Method values according to ISO 19148 definitions."

 == rdfs:label => ++ "LRMType", -- "LrMethod"

 == rdfs:member => :"absolute", ++ :"interpolative", :"relative", -- :"interpolation"

### ontorail:Enumeration rsm12e:Side modifications from rsm12:

 == rdfs:label => ++ "Side", -- "LateralSide"

 == xmi:tpos => ++ "11", -- "16"

### ontorail:Enumeration rsm12e:TransitionTypes modifications from rsm12:

 == rdfs:comment => ++ "Initial list of cant transition types. A union of the items proposed by IFC Rail and DB AG.", ++ "linearScissors\nDE: Schere (lineare-)", "s\_slope\nFR : doucines; DE: S-Rampe", -- "Initial list of cant transition types.", -- "linear\_scissors\nDE: Schere (lineare-)"

 == rdfs:member => ++ :"blossScissors", ++ :"blossSlope", ++ :"cosineCurve", ++ :"helmertCurve", ++ :"linearScissors", ++ :"linearTransition", :"s\_scissors", :"s\_slope", ++ :"sineCurve", ++ :"vienneseBend", -- :"bloss\_scissors", -- :"bloss\_slope", -- :"linear\_scissors", -- :"linear\_slope", -- :"other", -- :"undefined", -- :"unknown"