

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Framework for energy market communications –
Part 301: Common information model (CIM) extensions for markets**

**Cadre pour les communications pour le marché de l'énergie –
Partie 301: Extensions du modèle d'information commun (CIM) pour les marchés**



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CONTENTS

FOREWORD.....	27
INTRODUCTION.....	29
1 Scope.....	30
2 Normative references	31
3 Terms, definitions and abbreviated terms	31
3.1 Terms and definitions.....	31
3.2 Abbreviated terms.....	33
4 CIM specification	33
4.1 CIM modeling notation	33
4.2 CIM packages.....	33
4.3 CIM classes and relationships.....	35
4.3.1 Classes	35
4.3.2 Generalization	36
4.3.3 Simple association.....	37
4.3.4 Aggregation.....	38
4.4 CIM model concepts and examples.....	38
4.4.1 'MarketCommon' package.....	38
4.4.2 'MarketManagement' package	39
4.4.3 'MarketOperations' package	43
4.4.4 Environmental Data	50
4.5 Modeling guidelines	59
4.5.1 Modeling for change	59
4.5.2 Process for amendments to the CIM	59
4.5.3 Changes to the CIM UML model	60
4.5.4 Changes to the CIM standards documents.....	60
4.5.5 CIM profiles	60
4.6 Modeling tools	60
5 Detailed model	61
5.1 Overview.....	61
5.2 Context.....	61
6 Top package IEC62325	62
6.1 General.....	62
6.2 IEC62325CIMVersion root class.....	63
6.3 Package MarketCommon	64
6.3.1 General	64
6.3.2 MarketParticipant.....	64
6.3.3 MarketRole	65
6.3.4 RegisteredResource	66
6.3.5 MktGeneratingUnit.....	69
6.3.6 EnvironmentalMonitoringStation	71
6.3.7 ResourceCapacity root class	72
6.4 Package MarketManagement.....	73
6.4.1 General	73
6.4.2 AceTariffType root class	75
6.4.3 AttributeInstanceComponent root class.....	75
6.4.4 Auction	76

6.4.5	BidTimeSeries	77
6.4.6	ConstraintDuration root class.....	78
6.4.7	DateAndOrTime root class.....	79
6.4.8	Domain	79
6.4.9	FlowDirection root class.....	80
6.4.10	MarketAgreement	80
6.4.11	MarketDocument	82
6.4.12	MarketEvaluationPoint.....	83
6.4.13	MarketObjectStatus root class	84
6.4.14	MktPSRType	85
6.4.15	Period root class.....	85
6.4.16	Point root class.....	86
6.4.17	Price root class.....	86
6.4.18	Process	87
6.4.19	Quantity root class.....	88
6.4.20	Reason root class.....	88
6.4.21	Series	89
6.4.22	TimeSeries	90
6.4.23	Unit root class	91
6.5	Package MarketOperations	92
6.5.1	General	92
6.5.2	Package CongestionRevenueRights	94
6.5.3	Package MarketOpCommon	99
6.5.4	Package MarketPlan.....	107
6.5.5	Package MarketQualitySystem	119
6.5.6	Package MarketSystem	126
6.5.7	Package MktDomain	238
6.5.8	Package ParticipantInterfaces	262
6.5.9	Package ReferenceData	307
6.6	Package Environmental	393
6.6.1	General	393
6.6.2	AlertTypeList	402
6.6.3	AtmosphericAnalog.....	403
6.6.4	AtmosphericPhenomenon	404
6.6.5	ClassificationCondition	405
6.6.6	CloudCondition	405
6.6.7	Cyclone	406
6.6.8	Earthquake	407
6.6.9	EnvironmentalAnalog.....	407
6.6.10	EnvironmentalAlert	408
6.6.11	EnvironmentalCodedValue.....	409
6.6.12	EnvironmentalDataAuthority	410
6.6.13	EnvironmentalDataProvider	411
6.6.14	EnvironmentalDiscrete.....	412
6.6.15	EnvironmentalEvent.....	413
6.6.16	EnvironmentalInformation	414
6.6.17	EnvironmentalLocationType root class.....	415
6.6.18	EnvironmentalPhenomenon root class	415
6.6.19	EnvironmentalStringMeasurement	416

6.6.20	Fire.....	417
6.6.21	Flood	417
6.6.22	Forecast	418
6.6.23	GeosphericAnalog	418
6.6.24	GeosphericPhenomenon.....	419
6.6.25	Hurricane.....	420
6.6.26	HydrosphericAnalog	421
6.6.27	HydrosphericPhenomenon	422
6.6.28	Landslide.....	422
6.6.29	LightningStrike.....	423
6.6.30	MagneticStorm	423
6.6.31	Observation	424
6.6.32	PhenomenonClassification.....	425
6.6.33	ReportingCapability root class	425
6.6.34	SpaceAnalog	426
6.6.35	SpacePhenomenon.....	427
6.6.36	Tornado.....	427
6.6.37	TropicalCycloneAustralia	428
6.6.38	Tsunami	429
6.6.39	VolcanicAshCloud.....	430
6.6.40	Whirlpool	430
6.6.41	Package EnvDomain.....	431
	Bibliography.....	440
	Figure 1 – ‘TC 57CIM’ package dependency diagram.....	34
	Figure 2 – ‘IEC 62325’ package dependency diagram.....	35
	Figure 3 – Example of generalization	37
	Figure 4 – Example of simple association	37
	Figure 5 – Example of aggregation	38
	Figure 6 – Common market model	39
	Figure 7 – Market management model overview	40
	Figure 8 – Market management model	41
	Figure 9 – ‘MarketManagement’ ‘TimeSeries’ core concept.....	42
	Figure 10 – Market operator software systems for North American style electricity markets.....	44
	Figure 11 – Regional transmission organization for North American style electricity market	45
	Figure 12 – Registered resource reference definition for North American style electricity market	46
	Figure 13 – Bid definition for North American style electricity market	47
	Figure 14 – Resource bid schedule definitions for North American style electricity market	48
	Figure 15 – Market clearing for North American style electricity market.....	49
	Figure 16 – Demand Side Communication for North American style electricity market.....	50
	Figure 17 – Main Environmental classes	51
	Figure 18 – Utility Environmental Data Service	52
	Figure 19 – High Level Environmental Data Constructs.....	53

Figure 20 – Forecasts and observations	53
Figure 21 – Environmental measurements	54
Figure 22 – Environmental monitoring station	55
Figure 23 – Environmental Phenomenon.....	56
Figure 24 – Environmental Phenomenon classification.....	57
Figure 25 – Environmental Event	58
Figure 26 – Environmental alert	59
Figure 27 – Class diagram IEC62325::IEC62325Dependencies	63
Figure 28 – Class diagram MarketCommon::MarketCommon	64
Figure 29 – Class diagram MarketManagement::Inheritance	73
Figure 30 – Class diagram MarketManagement::MarketManagementOverview.....	74
Figure 31 – Package diagram MarketManagement::externalDependencies	75
Figure 32 – Package diagram MarketOperations::MarketOperations	93
Figure 33 – Class diagram MarketOperations::MarketOperationsDependencies	94
Figure 34 – Class diagram CongestionRevenueRights::CongestionRevenueRights	95
Figure 35 – Class diagram MarketPlan::MarketPlan	108
Figure 36 – Class diagram MarketQualitySystem::AllocationResults	120
Figure 37 – Class diagram ExternalInputs::ASRequirements.....	127
Figure 38 – Class diagram ExternalInputs::DefaultBids	128
Figure 39 – Class diagram ExternalInputs::DeratedBranchLimits	129
Figure 40 – Class diagram ExternalInputs::ExistingTransmissionContractRights	130
Figure 41 – Class diagram ExternalInputs::IntermittentResourceSchedules	131
Figure 42 – Class diagram ExternalInputs::LoadForecast.....	132
Figure 43 – Class diagram ExternalInputs::Telemetry	133
Figure 44 – Class diagram MarketResults::CommodityPricing.....	177
Figure 45 – Class diagram MarketResults::DistributedResourceDeployment	178
Figure 46 – Class diagram MarketResults::DistributedResourcePerformance.....	179
Figure 47 – Class diagram MarketResults::PnodeClearing	180
Figure 48 – Class diagram MarketResults::Instructions	181
Figure 49 – Class diagram MarketResults::MarketClearing	182
Figure 50 – Class diagram MarketResults::MarketClearingResults.....	183
Figure 51 – Class diagram MarketResults::MarketRegionClearing	184
Figure 52 – Class diagram MarketResults::ResourceAwardsClearing.....	185
Figure 53 – Class diagram MarketResults::TransactionBidClearing.....	186
Figure 54 – Class diagram ParticipantInterfaces::ParticipantBids.....	263
Figure 55 – Class diagram ParticipantInterfaces::ParticipantTrades.....	264
Figure 56 – Class diagram ParticipantInterfaces::ResourceBidSchedules	265
Figure 57 – Class diagram ParticipantInterfaces::ResourceBids.....	266
Figure 58 – Class diagram ParticipantInterfaces::TransactionBids	267
Figure 59 – Class diagram ReferenceData::AggregateNode.....	308
Figure 60 – Class diagram ReferenceData::Contracts	309
Figure 61 – Class diagram ReferenceData::MeteredSubSystem.....	310
Figure 62 – Class diagram ReferenceData::MultiStateGenerator.....	311

Figure 63 – Class diagram ReferenceData::PriceNode.....	312
Figure 64 – Class diagram ReferenceData::RTO.....	313
Figure 65 – Class diagram ReferenceData::RegisteredDistributedResource.....	314
Figure 66 – Class diagram ReferenceData::RegisteredGenerator	315
Figure 67 – Class diagram ReferenceData::RegisteredInterTie	316
Figure 68 – Class diagram ReferenceData::RegisteredLoad	317
Figure 69 – Class diagram ReferenceData::RegisteredResource	318
Figure 70 – Class diagram Environmental::EnvironmentalData	393
Figure 71 – Class diagram Environmental::EnvironmentalOverview	394
Figure 72 – Class diagram Environmental::EnvironmentalInformation	395
Figure 73 – Class diagram Environmental::EnvironmentalMeasurement.....	396
Figure 74 – Class diagram Environmental::EnvironmentalMeasurementDetail.....	397
Figure 75 – Class diagram Environmental::EnvironmentalMonitoringStation.....	398
Figure 76 – Class diagram Environmental::EnvironmentalPhenomenon	399
Figure 77 – Class diagram Environmental::EnvironmentalPhenomenonClassification.....	400
Figure 78 – Class diagram Environmental::EnvironmentalEvent	401
Figure 79 – Class diagram Environmental::EnvironmentalAlert	402
Figure 80 – Class diagram EnvDomain::EnvDomain.....	431
Table 1 – Attribute documentation	61
Table 2 – Association ends documentation	62
Table 3 – Enums documentation	62
Table 4 – Attributes of IEC62325::IEC62325CIMVersion.....	63
Table 5 – Attributes of MarketCommon::MarketParticipant.....	65
Table 6 – Association ends of MarketCommon::MarketParticipant with other classes.....	65
Table 7 – Attributes of MarketCommon::MarketRole	66
Table 8 – Association ends of MarketCommon::MarketRole with other classes	66
Table 9 – Attributes of MarketCommon::RegisteredResource.....	66
Table 10 – Association ends of MarketCommon::RegisteredResource with other classes	68
Table 11 – Attributes of MarketCommon::MktGeneratingUnit	69
Table 12 – Association ends of MarketCommon::MktGeneratingUnit with other classes	70
Table 13 – Attributes of MarketCommon::EnvironmentalMonitoringStation	71
Table 14 – Association ends of MarketCommon:: EnvironmentalMonitoringStation with other classes	72
Table 15 – Attributes of MarketCommon::ResourceCapacity	72
Table 16 – Association ends of MarketCommon::ResourceCapacity with other classes.....	72
Table 17 – Attributes of MarketManagement::AceTariffType	75
Table 18 – Association ends of MarketManagement::AceTariffType with other classes	75
Table 19 – Attributes of MarketManagement::AttributeInstanceComponent	76
Table 20 – Association ends of MarketManagement:: AttributeInstanceComponent with other classes	76
Table 21 – Attributes of MarketManagement::Auction	76
Table 22 – Association ends of MarketManagement::Auction with other classes	77

Table 23 – Attributes of MarketManagement::BidTimeSeries	77
Table 24 – Association ends of MarketManagement::BidTimeSeries with other classes	78
Table 25 – Attributes of MarketManagement::ConstraintDuration	78
Table 26 – Association ends of MarketManagement:: ConstraintDuration with other classes	79
Table 27 – Attributes of MarketManagement::DateAndOrTime	79
Table 28 – Association ends of MarketManagement::DateAndOrTime with other classes	79
Table 29 – Attributes of MarketManagement::Domain	79
Table 30 – Association ends of MarketManagement::Domain with other classes	80
Table 31 – Attributes of MarketManagement::FlowDirection	80
Table 32 – Association ends of MarketManagement::FlowDirection with other classes	80
Table 33 – Attributes of MarketManagement::MarketAgreement	81
Table 34 – Association ends of MarketManagement:: MarketAgreement with other classes	81
Table 35 – Attributes of MarketManagement::MarketDocument	82
Table 36 – Association ends of MarketManagement::MarketDocument with other classes	82
Table 37 – Attributes of MarketManagement::MarketEvaluationPoint	83
Table 38 – Association ends of MarketManagement:: MarketEvaluationPoint with other classes	84
Table 39 – Attributes of MarketManagement::MarketObjectStatus	84
Table 40 – Association ends of MarketManagement:: MarketObjectStatus with other classes	85
Table 41 – Attributes of MarketManagement::MktPSRType	85
Table 42 – Association ends of MarketManagement::MktPSRType with other classes	85
Table 43 – Attributes of MarketManagement::Period	85
Table 44 – Association ends of MarketManagement::Period with other classes	86
Table 45 – Attributes of MarketManagement::Point	86
Table 46 – Association ends of MarketManagement::Point with other classes	86
Table 47 – Attributes of MarketManagement::Price	87
Table 48 – Association ends of MarketManagement::Price with other classes	87
Table 49 – Attributes of MarketManagement::Process	87
Table 50 – Association ends of MarketManagement::Process with other classes	87
Table 51 – Attributes of MarketManagement::Quantity	88
Table 52 – Association ends of MarketManagement::Quantity with other classes	88
Table 53 – Attributes of MarketManagement::Reason	88
Table 54 – Association ends of MarketManagement::Reason with other classes	89
Table 55 – Attributes of MarketManagement::Series	89
Table 56 – Association ends of MarketManagement::Series with other classes	89
Table 57 – Attributes of MarketManagement::TimeSeries	90
Table 58 – Association ends of MarketManagement::TimeSeries with other classes	91
Table 59 – Attributes of MarketManagement::Unit	91
Table 60 – Association ends of MarketManagement::Unit with other classes	92
Table 61 – Attributes of CongestionRevenueRights::CongestionRevenueRight	96

Table 62 – Association ends of CongestionRevenueRights:: CongestionRevenueRight with other classes	97
Table 63 – Attributes of CongestionRevenueRights::CRROrgRole	97
Table 64 – Association ends of CongestionRevenueRights:: CRROrgRole with other classes	98
Table 65 – Attributes of CongestionRevenueRights::CRRSegment	98
Table 66 – Association ends of CongestionRevenueRights:: CRRSegment with other classes	98
Table 67 – Attributes of MarketOpCommon::MarketInvoice	99
Table 68 – Association ends of MarketOpCommon::MarketInvoice with other classes	99
Table 69 – Attributes of MarketOpCommon::MarketInvoiceLineItem	100
Table 70 – Association ends of MarketOpCommon:: MarketInvoiceLineItem with other classes	100
Table 71 – Association ends of MarketOpCommon::MarketLedger with other classes	100
Table 72 – Attributes of MarketOpCommon::MarketLedgerEntry	101
Table 73 – Association ends of MarketOpCommon:: MarketLedgerEntry with other classes	101
Table 74 – Attributes of MarketOpCommon::MktActivityRecord	101
Table 75 – Association ends of MarketOpCommon:: MktActivityRecord with other classes	102
Table 76 – Attributes of MarketOpCommon::MktConnectivityNode	102
Table 77 – Association ends of MarketOpCommon:: MktConnectivityNode with other classes	102
Table 78 – Attributes of MarketOpCommon::MktLine	103
Table 79 – Association ends of MarketOpCommon::MktLine with other classes	103
Table 80 – Attributes of MarketOpCommon::MktMeasurement	104
Table 81 – Association ends of MarketOpCommon::MktMeasurement with other classes	104
Table 82 – Attributes of MarketOpCommon::MktPowerTransformer	104
Table 83 – Association ends of MarketOpCommon:: MktPowerTransformer with other classes	105
Table 84 – Attributes of MarketOpCommon::MktTerminal	106
Table 85 – Association ends of MarketOpCommon::MktTerminal with other classes	106
Table 86 – Attributes of MarketOpCommon::MktUserAttribute	107
Table 87 – Association ends of MarketOpCommon::MktUserAttribute with other classes	107
Table 88 – Attributes of MarketPlan::CommodityDefinition	108
Table 89 – Association ends of MarketPlan::CommodityDefinition with other classes	109
Table 90 – Attributes of MarketPlan::CRRMarket	109
Table 91 – Association ends of MarketPlan::CRRMarket with other classes	110
Table 92 – Attributes of MarketPlan::DistributedResourceActualEvent	110
Table 93 – Association ends of MarketPlan:: DistributedResourceActualEvent with other classes	111
Table 94 – Attributes of MarketPlan::EnergyMarket	111
Table 95 – Association ends of MarketPlan::EnergyMarket with other classes	112
Table 96 – Attributes of MarketPlan::Market	112
Table 97 – Association ends of MarketPlan::Market with other classes	113

Table 98 – Attributes of MarketPlan::MarketActualEvent	113
Table 99 – Association ends of MarketPlan::MarketActualEvent with other classes	114
Table 100 – Attributes of MarketPlan::MarketFactors	114
Table 101 – Association ends of MarketPlan::MarketFactors with other classes	115
Table 102 – Attributes of MarketPlan::MarketPlan	115
Table 103 – Association ends of MarketPlan::MarketPlan with other classes	115
Table 104 – Attributes of MarketPlan::MarketProduct	116
Table 105 – Association ends of MarketPlan::MarketProduct with other classes	116
Table 106 – Attributes of MarketPlan::MarketRun	117
Table 107 – Association ends of MarketPlan::MarketRun with other classes	117
Table 108 – Attributes of MarketPlan::PlannedMarket	118
Table 109 – Association ends of MarketPlan::PlannedMarket with other classes	118
Table 110 – Attributes of MarketPlan::PlannedMarketEvent	118
Table 111 – Association ends of MarketPlan::PlannedMarketEvent with other classes	119
Table 112 – Attributes of MarketQualitySystem::AllocationResult	121
Table 113 – Association ends of MarketQualitySystem:: AllocationResult with other classes	121
Table 114 – Attributes of MarketQualitySystem::AllocationResultValues	121
Table 115 – Association ends of MarketQualitySystem:: AllocationResultValues with other classes	122
Table 116 – Attributes of MarketQualitySystem::AuxiliaryCost	122
Table 117 – Association ends of MarketQualitySystem::AuxiliaryCost with other classes	122
Table 118 – Association ends of MarketQualitySystem:: AuxiliaryObject with other classes	122
Table 119 – Attributes of MarketQualitySystem::AuxiliaryValues	123
Table 120 – Association ends of MarketQualitySystem:: AuxiliaryValues with other classes	123
Table 121 – Attributes of MarketQualitySystem::ExpectedEnergy	123
Table 122 – Association ends of MarketQualitySystem:: ExpectedEnergy with other classes	123
Table 123 – Attributes of MarketQualitySystem::ExpectedEnergyValues	124
Table 124 – Association ends of MarketQualitySystem:: ExpectedEnergyValues with other classes	124
Table 125 – Attributes of MarketQualitySystem::FiveMinAuxiliaryData	124
Table 126 – Association ends of MarketQualitySystem:: FiveMinAuxiliaryData with other classes	124
Table 127 – Attributes of MarketQualitySystem::TenMinAuxiliaryData	125
Table 128 – Association ends of MarketQualitySystem:: TenMinAuxiliaryData with other classes	125
Table 129 – Attributes of MarketQualitySystem::TradingHubPrice	125
Table 130 – Association ends of MarketQualitySystem:: TradingHubPrice with other classes	125
Table 131 – Attributes of MarketQualitySystem::TradingHubValues	125
Table 132 – Association ends of MarketQualitySystem:: TradingHubValues with other classes	126

Table 133 – Attributes of ExternalInputs::ASRequirements	134
Table 134 – Association ends of ExternalInputs::ASRequirements with other classes	134
Table 135 – Attributes of ExternalInputs::AnalogMeasurementValueQuality	134
Table 136 – Association ends of ExternalInputs:: AnalogMeasurementValueQuality with other classes	135
Table 137 – Attributes of ExternalInputs::AreaLoadCurve	135
Table 138 – Association ends of ExternalInputs::AreaLoadCurve with other classes	135
Table 139 – Attributes of ExternalInputs::BaseCaseConstraintLimit	136
Table 140 – Association ends of ExternalInputs:: BaseCaseConstraintLimit with other classes	136
Table 141 – Attributes of ExternalInputs::BranchEndFlow	137
Table 142 – Association ends of ExternalInputs::BranchEndFlow with other classes	137
Table 143 – Attributes of ExternalInputs::ConstraintTerm	137
Table 144 – Association ends of ExternalInputs::ConstraintTerm with other classes	138
Table 145 – Attributes of ExternalInputs::ContingencyConstraintLimit	138
Table 146 – Association ends of ExternalInputs:: ContingencyConstraintLimit with other classes	139
Table 147 – Attributes of ExternalInputs::ControlAreaSolutionData	139
Table 148 – Association ends of ExternalInputs:: ControlAreaSolutionData with other classes	139
Table 149 – Attributes of ExternalInputs::DefaultBid	140
Table 150 – Association ends of ExternalInputs::DefaultBid with other classes	141
Table 151 – Attributes of ExternalInputs::DefaultBidCurve	141
Table 152 – Association ends of ExternalInputs::DefaultBidCurve with other classes	142
Table 153 – Attributes of ExternalInputs::DefaultBidCurveData	142
Table 154 – Association ends of ExternalInputs:: DefaultBidCurveData with other classes	142
Table 155 – Attributes of ExternalInputs::DefaultConstraintLimit	143
Table 156 – Association ends of ExternalInputs:: DefaultConstraintLimit with other classes	143
Table 157 – Attributes of ExternalInputs::DiscreteMeasurementValueQuality	144
Table 158 – Association ends of ExternalInputs:: DiscreteMeasurementValueQuality with other classes	144
Table 159 – Attributes of ExternalInputs::DistributionFactorSet	144
Table 160 – Association ends of ExternalInputs:: DistributionFactorSet with other classes	145
Table 161 – Attributes of ExternalInputs::EnergyPriceIndex	145
Table 162 – Association ends of ExternalInputs::EnergyPriceIndex with other classes	145
Table 163 – Attributes of ExternalInputs::EnergyProfile	146
Table 164 – Association ends of ExternalInputs::EnergyProfile with other classes	146
Table 165 – Attributes of ExternalInputs::EnergyTransaction	146
Table 166 – Association ends of ExternalInputs::EnergyTransaction with other classes	147
Table 167 – Attributes of ExternalInputs::GenDistributionFactor	148
Table 168 – Association ends of ExternalInputs:: GenDistributionFactor with other classes	148
Table 169 – Attributes of ExternalInputs::GeneratingUnitDynamicValues	148

Table 170 – Association ends of ExternalInputs::GeneratingUnitDynamicValues with other classes	148
Table 171 – Attributes of ExternalInputs::GenericConstraints.....	149
Table 172 – Association ends of ExternalInputs::GenericConstraints with other classes	149
Table 173 – Attributes of ExternalInputs::InterchangeETCData	149
Table 174 – Association ends of ExternalInputs::InterchangeETCData with other classes	150
Table 175 – Attributes of ExternalInputs::InterchangeSchedule.....	150
Table 176 – Association ends of ExternalInputs::InterchangeSchedule with other classes	151
Table 177 – Attributes of ExternalInputs::IntermittentResourceEligibility	151
Table 178 – Association ends of ExternalInputs::IntermittentResourceEligibility with other classes	152
Table 179 – Attributes of ExternalInputs::LoadDistributionFactor	152
Table 180 – Association ends of ExternalInputs::LoadDistributionFactor with other classes	152
Table 181 – Attributes of ExternalInputs::LossSensitivity	153
Table 182 – Association ends of ExternalInputs::LossSensitivity with other classes	153
Table 183 – Association ends of ExternalInputs::MWLimitSchedule with other classes	154
Table 184 – Attributes of ExternalInputs::MktACLineSegment.....	154
Table 185 – Association ends of ExternalInputs::MktACLineSegment with other classes.....	155
Table 186 – Attributes of ExternalInputs::MktAnalogLimit.....	156
Table 187 – Association ends of ExternalInputs::MktAnalogLimit with other classes	156
Table 188 – Attributes of ExternalInputs::MktAnalogLimitSet	156
Table 189 – Association ends of ExternalInputs::MktAnalogLimitSet with other classes	157
Table 190 – Attributes of ExternalInputs::MktControlArea	157
Table 191 – Association ends of ExternalInputs::MktControlArea with other classes	157
Table 192 – Attributes of ExternalInputs::MktSeriesCompensator	158
Table 193 – Association ends of ExternalInputs::MktSeriesCompensator with other classes	158
Table 194 – Attributes of ExternalInputs::MktShuntCompensator	159
Table 195 – Association ends of ExternalInputs::MktShuntCompensator with other classes	160
Table 196 – Attributes of ExternalInputs::MktSwitch.....	160
Table 197 – Association ends of ExternalInputs::MktSwitch with other classes	161
Table 198 – Attributes of ExternalInputs::MktTapChanger.....	162
Table 199 – Association ends of ExternalInputs::MktTapChanger with other classes	162
Table 200 – Attributes of ExternalInputs::NodeConstraintTerm	163
Table 201 – Association ends of ExternalInputs::NodeConstraintTerm with other classes	163
Table 202 – Attributes of ExternalInputs::Profile	163
Table 203 – Association ends of ExternalInputs::Profile with other classes	163
Table 204 – Attributes of ExternalInputs::ProfileData	164
Table 205 – Association ends of ExternalInputs::ProfileData with other classes.....	164
Table 206 – Attributes of ExternalInputs::ReserveDemandCurve	164

Table 207 – Association ends of ExternalInputs:: ReserveDemandCurve with other classes	165
Table 208 – Attributes of ExternalInputs::SCADAInformation	165
Table 209 – Attributes of ExternalInputs::SecurityConstraintSum	166
Table 210 – Association ends of ExternalInputs:: SecurityConstraintSum with other classes	166
Table 211 – Attributes of ExternalInputs::SecurityConstraints	167
Table 212 – Association ends of ExternalInputs::SecurityConstraints with other classes	167
Table 213 – Attributes of ExternalInputs::ServicePoint	168
Table 214 – Association ends of ExternalInputs::ServicePoint with other classes	168
Table 215 – Attributes of ExternalInputs::ShuntCompensatorDynamicData	169
Table 216 – Association ends of ExternalInputs:: ShuntCompensatorDynamicData with other classes	169
Table 217 – Attributes of ExternalInputs::SwitchStatus	169
Table 218 – Association ends of ExternalInputs::SwitchStatus with other classes	169
Table 219 – Attributes of ExternalInputs::SysLoadDistributionFactor	170
Table 220 – Association ends of ExternalInputs:: SysLoadDistributionFactor with other classes	170
Table 221 – Attributes of ExternalInputs::TREntitlement	170
Table 222 – Association ends of ExternalInputs::TREntitlement with other classes	170
Table 223 – Attributes of ExternalInputs::TapChangerDynamicData	171
Table 224 – Association ends of ExternalInputs:: TapChangerDynamicData with other classes	171
Table 225 – Attributes of ExternalInputs::TerminalConstraintTerm	171
Table 226 – Association ends of ExternalInputs:: TerminalConstraintTerm with other classes	172
Table 227 – Attributes of ExternalInputs::TransferInterface	172
Table 228 – Association ends of ExternalInputs::TransferInterface with other classes	172
Table 229 – Attributes of ExternalInputs::TransferInterfaceSolution	173
Table 230 – Association ends of ExternalInputs:: TransferInterfaceSolution with other classes	173
Table 231 – Attributes of ExternalInputs::TransmissionCapacity	173
Table 232 – Association ends of ExternalInputs:: TransmissionCapacity with other classes	174
Table 233 – Attributes of ExternalInputs::TransmissionInterfaceRightEntitlement	174
Table 234 – Association ends of ExternalInputs:: TransmissionInterfaceRightEntitlement with other classes	174
Table 235 – Attributes of ExternalInputs::TransmissionPath	175
Table 236 – Association ends of ExternalInputs::TransmissionPath with other classes	175
Table 237 – Association ends of ExternalInputs:: TransmissionReservation with other classes	175
Table 238 – Attributes of ExternalInputs::UnitInitialConditions	176
Table 239 – Association ends of ExternalInputs::UnitInitialConditions with other classes	176
Table 240 – Attributes of MarketResults::AncillaryServiceClearing	187
Table 241 – Association ends of MarketResults:: AncillaryServiceClearing with other classes	187

Table 242 – Attributes of MarketResults::BillDeterminant	188
Table 243 – Association ends of MarketResults::BillDeterminant with other classes	189
Table 244 – Attributes of MarketResults::ChargeProfile	189
Table 245 – Association ends of MarketResults::ChargeProfile with other classes	190
Table 246 – Attributes of MarketResults::ChargeProfileData	190
Table 247 – Association ends of MarketResults::ChargeProfileData with other classes	190
Table 248 – Attributes of MarketResults::CommitmentClearing	191
Table 249 – Association ends of MarketResults:: CommitmentClearing with other classes	191
Table 250 – Attributes of MarketResults::Commitments	192
Table 251 – Association ends of MarketResults::Commitments with other classes	192
Table 252 – Attributes of MarketResults::CommodityPrice	192
Table 253 – Association ends of MarketResults::CommodityPrice with other classes	193
Table 254 – Attributes of MarketResults::ConstraintClearing	193
Table 255 – Association ends of MarketResults::ConstraintClearing with other classes	193
Table 256 – Attributes of MarketResults::ConstraintResults	194
Table 257 – Association ends of MarketResults::ConstraintResults with other classes	195
Table 258 – Attributes of MarketResults::DopInstruction	195
Table 259 – Association ends of MarketResults::DopInstruction with other classes	195
Table 260 – Attributes of MarketResults::DotInstruction	196
Table 261 – Association ends of MarketResults::DotInstruction with other classes	197
Table 262 – Attributes of MarketResults::ExPostLoss	197
Table 263 – Association ends of MarketResults::ExPostLoss with other classes	197
Table 264 – Attributes of MarketResults::ExPostLossResults	198
Table 265 – Association ends of MarketResults::ExPostLossResults with other classes	198
Table 266 – Attributes of MarketResults::ExPostMarketRegion	198
Table 267 – Association ends of MarketResults::ExPostMarketRegion with other classes	199
Table 268 – Attributes of MarketResults::ExPostMarketRegionResults	199
Table 269 – Association ends of MarketResults:: ExPostMarketRegionResults with other classes	200
Table 270 – Attributes of MarketResults::ExPostPricing	200
Table 271 – Association ends of MarketResults::ExPostPricing with other classes	200
Table 272 – Attributes of MarketResults::ExPostPricingResults	201
Table 273 – Association ends of MarketResults:: ExPostPricingResults with other classes	201
Table 274 – Attributes of MarketResults::ExPostResource	202
Table 275 – Association ends of MarketResults::ExPostResource with other classes	202
Table 276 – Attributes of MarketResults::ExPostResourceResults	203
Table 277 – Association ends of MarketResults:: ExPostResourceResults with other classes	203
Table 278 – Attributes of MarketResults::GeneralClearing	203
Table 279 – Association ends of MarketResults::GeneralClearing with other classes	204
Table 280 – Attributes of MarketResults::GeneralClearingResults	204

Table 281 – Association ends of MarketResults:: GeneralClearingResults with other classes	205
Table 282 – Attributes of MarketResults::InstructionClearing	205
Table 283 – Association ends of MarketResults::InstructionClearing with other classes	205
Table 284 – Attributes of MarketResults::InstructionClearingDOP	206
Table 285 – Association ends of MarketResults:: InstructionClearingDOP with other classes	207
Table 286 – Attributes of MarketResults::InstructionClearingDOT	207
Table 287 – Association ends of MarketResults:: InstructionClearingDOT with other classes	208
Table 288 – Attributes of MarketResults::Instructions.....	208
Table 289 – Association ends of MarketResults::Instructions with other classes	209
Table 290 – Attributes of MarketResults::LoadFollowingOperatorInput.....	209
Table 291 – Association ends of MarketResults:: LoadFollowingOperatorInput with other classes	209
Table 292 – Attributes of MarketResults::LossClearing	210
Table 293 – Association ends of MarketResults::LossClearing with other classes	210
Table 294 – Attributes of MarketResults::LossClearingResults.....	211
Table 295 – Association ends of MarketResults::LossClearingResults with other classes	211
Table 296 – Attributes of MarketResults::MPMClearing.....	211
Table 297 – Association ends of MarketResults::MPMClearing with other classes	212
Table 298 – Attributes of MarketResults::MPMResourceStatus	212
Table 299 – Association ends of MarketResults::MPMResourceStatus with other classes	212
Table 300 – Attributes of MarketResults::MPMTestResults	213
Table 301 – Association ends of MarketResults::MPMTestResults with other classes	213
Table 302 – Attributes of MarketResults::MarketRegionResults	213
Table 303 – Association ends of MarketResults:: MarketRegionResults with other classes	214
Table 304 – Attributes of MarketResults::MarketResults	214
Table 305 – Association ends of MarketResults::MarketResults with other classes	214
Table 306 – Attributes of MarketResults::MarketStatement	215
Table 307 – Association ends of MarketResults::MarketStatement with other classes	215
Table 308 – Attributes of MarketResults::MarketStatementLineItem	216
Table 309 – Association ends of MarketResults:: MarketStatementLineItem with other classes	216
Table 310 – Attributes of MarketResults::MitigatedBid	217
Table 311 – Association ends of MarketResults::MitigatedBid with other classes	217
Table 312 – Attributes of MarketResults::MitigatedBidClearing	217
Table 313 – Association ends of MarketResults::MitigatedBidClearing with other classes	218
Table 314 – Attributes of MarketResults::MitigatedBidSegment.....	218
Table 315 – Association ends of MarketResults:: MitigatedBidSegment with other classes	219
Table 316 – Attributes of MarketResults::PassThroughBill	219

Table 317 – Association ends of MarketResults::PassThroughBill with other classes	220
Table 318 – Attributes of MarketResults::PnodeClearing	221
Table 319 – Association ends of MarketResults::PnodeClearing with other classes	221
Table 320 – Attributes of MarketResults::PnodeResults	222
Table 321 – Association ends of MarketResults::PnodeResults with other classes	222
Table 322 – Attributes of MarketResults::PriceDescriptor	222
Table 323 – Association ends of MarketResults::PriceDescriptor with other classes	223
Table 324 – Association ends of MarketResults::RMRDetermination with other classes	223
Table 325 – Attributes of MarketResults::RMROperatorInput	223
Table 326 – Association ends of MarketResults::RMROperatorInput with other classes	224
Table 327 – Attributes of MarketResults::RUCAwardInstruction	225
Table 328 – Association ends of MarketResults:: RUCAwardInstruction with other classes	225
Table 329 – Attributes of MarketResults::ResourceAwardClearing	226
Table 330 – Association ends of MarketResults:: ResourceAwardClearing with other classes	226
Table 331 – Attributes of MarketResults::ResourceAwardInstruction	227
Table 332 – Association ends of MarketResults:: ResourceAwardInstruction with other classes	228
Table 333 – Attributes of MarketResults::ResourceClearing	228
Table 334 – Association ends of MarketResults::ResourceClearing with other classes	229
Table 335 – Attributes of MarketResults::ResourceDeploymentStatus	229
Table 336 – Association ends of MarketResults:: ResourceDeploymentStatus with other classes	230
Table 337 – Attributes of MarketResults::ResourceDispatchResults	230
Table 338 – Association ends of MarketResults:: ResourceDispatchResults with other classes	231
Table 339 – Attributes of MarketResults::ResourceLoadFollowingInst	231
Table 340 – Association ends of MarketResults:: ResourceLoadFollowingInst with other classes	231
Table 341 – Attributes of MarketResults::ResourcePerformanceEvaluation	232
Table 342 – Association ends of MarketResults:: ResourcePerformanceEvaluation with other classes	232
Table 343 – Attributes of MarketResults::ResourcePerformanceGlobalFactor	233
Table 344 – Association ends of MarketResults:: ResourcePerformanceGlobalFactor with other classes	233
Table 345 – Attributes of MarketResults::ResourcePerformanceRating	233
Table 346 – Association ends of MarketResults:: ResourcePerformanceRating with other classes	234
Table 347 – Attributes of MarketResults::ResourcePerformanceTimeSeriesFactor	234
Table 348 – Association ends of MarketResults:: ResourcePerformanceTimeSeriesFactor with other classes	235
Table 349 – Attributes of MarketResults::SelfScheduleBreakdown	235
Table 350 – Association ends of MarketResults:: SelfScheduleBreakdown with other classes	235
Table 351 – Attributes of MarketResults::Settlement	236

Table 352 – Association ends of MarketResults::Settlement with other classes	236
Table 353 – Attributes of MarketResults::TransactionBidClearing	237
Table 354 – Association ends of MarketResults:: TransactionBidClearing with other classes	237
Table 355 – Attributes of MarketResults::TransactionBidResults	238
Table 356 – Association ends of MarketResults:: TransactionBidResults with other classes	238
Table 357 – Literals of MktDomain::ActionType	238
Table 358 – Literals of MktDomain::AnalogLimitType	239
Table 359 – Literals of MktDomain::AnodeType	239
Table 360 – Literals of MktDomain::ApnodeType	240
Table 361 – Literals of MktDomain::AreaControlMode	240
Table 362 – Literals of MktDomain::AutomaticDisplnstTypeCommitment	241
Table 363 – Literals of MktDomain::AutomaticDispatchMode	241
Table 364 – Literals of MktDomain::BidCalculationBasis	241
Table 365 – Literals of MktDomain::BidMitigationStatus	242
Table 366 – Literals of MktDomain::BidMitigationType	242
Table 367 – Literals of MktDomain::BidType	242
Table 368 – Literals of MktDomain::BidTypeRMR	243
Table 369 – Literals of MktDomain::CRRCategoryType	243
Table 370 – Literals of MktDomain::CRRHedgeType	243
Table 371 – Literals of MktDomain::CRRRoleType	243
Table 372 – Literals of MktDomain::CRRSegmentType	244
Table 373 – Literals of MktDomain::CheckOutType	244
Table 374 – Literals of MktDomain::CommitmentType	244
Table 375 – Literals of MktDomain::ConstraintLimitType	245
Table 376 – Literals of MktDomain::ConstraintRampType	245
Table 377 – Literals of MktDomain::ContractType	245
Table 378 – Literals of MktDomain::CostBasis	246
Table 379 – Literals of MktDomain::DispatchResponseType	246
Table 380 – Literals of MktDomain::EnergyPriceIndexType	246
Table 381 – Literals of MktDomain::EnergyProductType	247
Table 382 – Literals of MktDomain::EquipmentStatusType	247
Table 383 – Literals of MktDomain::EnergyTransactionType	247
Table 384 – Literals of MktDomain::ExecutionType	248
Table 385 – Literals of MktDomain::FlagTypeRMR	248
Table 386 – Literals of MktDomain::FlowDirectionType	248
Table 387 – Literals of MktDomain::FuelSource	249
Table 388 – Literals of MktDomain::InterTieDirection	249
Table 389 – Literals of MktDomain::LoadForecastType	250
Table 390 – Literals of MktDomain::MPMTestIdentifierType	250
Table 391 – Literals of MktDomain::MPMTestMethodType	250
Table 392 – Literals of MktDomain::MPMTestOutcome	251
Table 393 – Literals of MktDomain::MQSCHGType	251

Table 394 – Literals of MktDomain::MQSInstructionSource	251
Table 395 – Literals of MktDomain::MarketEventStatusKind	252
Table 396 – Literals of MktDomain::MarketProductSelfSchedType	252
Table 397 – Literals of MktDomain::MarketProductType	253
Table 398 – Literals of MktDomain::MarketType	253
Table 399 – Literals of MktDomain::MktAccountKind	253
Table 400 – Literals of MktDomain::MktBillMediaKind	254
Table 401 – Literals of MktDomain::MktInvoiceLineItemKind	254
Table 402 – Literals of MktDomain::OnOff	254
Table 403 – Literals of MktDomain::ParticipationCategoryMPM	254
Table 404 – Literals of MktDomain::PassIndicatorType	255
Table 405 – Literals of MktDomain::PriceTypeKind	255
Table 406 – Literals of MktDomain::PurposeFlagType	256
Table 407 – Literals of MktDomain::RampCurveType	256
Table 408 – Literals of MktDomain::RampRateCondition	256
Table 409 – Literals of MktDomain::RampRateType	257
Table 410 – Literals of MktDomain::ReserveRequirementType	257
Table 411 – Literals of MktDomain::ResourceAssnType	257
Table 412 – Literals of MktDomain::ResourceCapacityType	258
Table 413 – Literals of MktDomain::ResourceCertificationKind	258
Table 414 – Literals of MktDomain::ResourceLimitIndicator	258
Table 415 – Literals of MktDomain::ResourceRegistrationStatus	259
Table 416 – Literals of MktDomain::ResultsConstraintType	259
Table 417 – Literals of MktDomain::SelfSchedReferenceType	259
Table 418 – Literals of MktDomain::SelfScheduleBreakdownType	260
Table 419 – Literals of MktDomain::SwitchStatusType	260
Table 420 – Literals of MktDomain::TRType	260
Table 421 – Literals of MktDomain::TimeOfUse	260
Table 422 – Literals of MktDomain::TradeType	261
Table 423 – Literals of MktDomain::UnitRegulationKind	261
Table 424 – Literals of MktDomain::UnitType	262
Table 425 – Literals of MktDomain::YesNo	262
Table 426 – Attributes of ParticipantInterfaces::ActionRequest	267
Table 427 – Association ends of ParticipantInterfaces:: ActionRequest with other classes	267
Table 428 – Attributes of ParticipantInterfaces::AreaLoadBid	268
Table 429 – Association ends of ParticipantInterfaces::AreaLoadBid with other classes	268
Table 430 – Attributes of ParticipantInterfaces::AttributeProperty	269
Table 431 – Association ends of ParticipantInterfaces:: AttributeProperty with other classes	269
Table 432 – Attributes of ParticipantInterfaces::Bid	269
Table 433 – Association ends of ParticipantInterfaces::Bid with other classes	270
Table 434 – Attributes of ParticipantInterfaces::BidDistributionFactor	271

Table 435 – Association ends of ParticipantInterfaces:: BidDistributionFactor with other classes	271
Table 436 – Attributes of ParticipantInterfaces::BidError	271
Table 437 – Association ends of ParticipantInterfaces::BidError with other classes	272
Table 438 – Attributes of ParticipantInterfaces::BidHourlyProductSchedule	272
Table 439 – Association ends of ParticipantInterfaces:: BidHourlyProductSchedule with other classes	272
Table 440 – Attributes of ParticipantInterfaces::BidHourlySchedule	273
Table 441 – Association ends of ParticipantInterfaces:: BidHourlySchedule with other classes	273
Table 442 – Attributes of ParticipantInterfaces::BidPriceCurve	274
Table 443 – Association ends of ParticipantInterfaces::BidPriceCurve with other classes	274
Table 444 – Attributes of ParticipantInterfaces::BidPriceSchedule	275
Table 445 – Association ends of ParticipantInterfaces:: BidPriceSchedule with other classes	275
Table 446 – Attributes of ParticipantInterfaces::BidSelfSched	276
Table 447 – Association ends of ParticipantInterfaces::BidSelfSched with other classes	277
Table 448 – Attributes of ParticipantInterfaces::BidSet	277
Table 449 – Association ends of ParticipantInterfaces::BidSet with other classes	278
Table 450 – Attributes of ParticipantInterfaces::ChargeComponent	278
Table 451 – Association ends of ParticipantInterfaces:: ChargeComponent with other classes	278
Table 452 – Attributes of ParticipantInterfaces::ChargeGroup	279
Table 453 – Association ends of ParticipantInterfaces::ChargeGroup with other classes	279
Table 454 – Attributes of ParticipantInterfaces::ChargeType	280
Table 455 – Association ends of ParticipantInterfaces::ChargeType with other classes	280
Table 456 – Attributes of ParticipantInterfaces::DispatchInstReply	281
Table 457 – Association ends of ParticipantInterfaces:: DispatchInstReply with other classes	282
Table 458 – Association ends of ParticipantInterfaces:: EnergyPriceCurve with other classes	282
Table 459 – Attributes of ParticipantInterfaces::GeneratingBid	282
Table 460 – Association ends of ParticipantInterfaces::GeneratingBid with other classes	284
Table 461 – Attributes of ParticipantInterfaces::HourlyPreDispatchSchedule	285
Table 462 – Association ends of ParticipantInterfaces:: HourlyPreDispatchSchedule with other classes	285
Table 463 – Attributes of ParticipantInterfaces::InterTieBid	285
Table 464 – Association ends of ParticipantInterfaces::InterTieBid with other classes	286
Table 465 – Attributes of ParticipantInterfaces::InterTieDispatchResponse	287
Table 466 – Association ends of ParticipantInterfaces:: InterTieDispatchResponse with other classes	287
Table 467 – Attributes of ParticipantInterfaces::LoadBid	288
Table 468 – Association ends of ParticipantInterfaces::LoadBid with other classes	289
Table 469 – Attributes of ParticipantInterfaces::LoadFollowingInst	290

Table 470 – Association ends of ParticipantInterfaces:: LoadFollowingInst with other classes	290
Table 471 – Attributes of ParticipantInterfaces::LoadReductionPriceCurve	290
Table 472 – Association ends of ParticipantInterfaces:: LoadReductionPriceCurve with other classes	291
Table 473 – Attributes of ParticipantInterfaces::MajorChargeGroup	291
Table 474 – Association ends of ParticipantInterfaces:: MajorChargeGroup with other classes	292
Table 475 – Attributes of ParticipantInterfaces::MarketScheduledEvent	292
Table 476 – Association ends of ParticipantInterfaces:: MarketScheduledEvent with other classes	292
Table 477 – Attributes of ParticipantInterfaces::NotificationTimeCurve.....	293
Table 478 – Association ends of ParticipantInterfaces:: NotificationTimeCurve with other classes	293
Table 479 – Attributes of ParticipantInterfaces::OpenTieSchedule	294
Table 480 – Association ends of ParticipantInterfaces:: OpenTieSchedule with other classes	294
Table 481 – Attributes of ParticipantInterfaces::ProductBid	294
Table 482 – Association ends of ParticipantInterfaces::ProductBid with other classes.....	295
Table 483 – Attributes of ParticipantInterfaces::PumpingCostSchedule.....	295
Table 484 – Association ends of ParticipantInterfaces:: PumpingCostSchedule with other classes	296
Table 485 – Attributes of ParticipantInterfaces::PumpingLevelSchedule	296
Table 486 – Association ends of ParticipantInterfaces:: PumpingLevelSchedule with other classes	297
Table 487 – Attributes of ParticipantInterfaces::PumpingShutDownCostSchedule	297
Table 488 – Association ends of ParticipantInterfaces:: PumpingShutDownCostSchedule with other classes	298
Table 489 – Attributes of ParticipantInterfaces::RampRateCurve	298
Table 490 – Association ends of ParticipantInterfaces:: RampRateCurve with other classes	299
Table 491 – Attributes of ParticipantInterfaces::ResourceBid	299
Table 492 – Association ends of ParticipantInterfaces::ResourceBid with other classes.....	300
Table 493 – Attributes of ParticipantInterfaces::StartupCostCurve.....	301
Table 494 – Association ends of ParticipantInterfaces:: StartupCostCurve with other classes	302
Table 495 – Attributes of ParticipantInterfaces::StartupTimeCurve	302
Table 496 – Association ends of ParticipantInterfaces:: StartupTimeCurve with other classes	303
Table 497 – Attributes of ParticipantInterfaces::Trade.....	303
Table 498 – Association ends of ParticipantInterfaces::Trade with other classes	304
Table 499 – Attributes of ParticipantInterfaces::TradeError	304
Table 500 – Association ends of ParticipantInterfaces::TradeError with other classes.....	305
Table 501 – Attributes of ParticipantInterfaces::TradeProduct.....	305
Table 502 – Association ends of ParticipantInterfaces::TradeProduct with other classes	306
Table 503 – Attributes of ParticipantInterfaces::TransactionBid.....	306

Table 504 – Association ends of ParticipantInterfaces:: TransactionBid with other classes	307
Table 505 – Attributes of ReferenceData::AdjacentCASet	319
Table 506 – Association ends of ReferenceData::AdjacentCASet with other classes	319
Table 507 – Attributes of ReferenceData::AggregateNode	319
Table 508 – Association ends of ReferenceData::AggregateNode with other classes	320
Table 509 – Attributes of ReferenceData::AggregatedPnode	320
Table 510 – Association ends of ReferenceData::AggregatedPnode with other classes	321
Table 511 – Attributes of ReferenceData::BidPriceCap	321
Table 512 – Association ends of ReferenceData::BidPriceCap with other classes	322
Table 513 – Attributes of ReferenceData::CnodeDistributionFactor	322
Table 514 – Association ends of ReferenceData:: CnodeDistributionFactor with other classes	322
Table 515 – Attributes of ReferenceData::CombinedCycleConfiguration	323
Table 516 – Association ends of ReferenceData:: CombinedCycleConfiguration with other classes	325
Table 517 – Attributes of ReferenceData::CombinedCycleConfigurationMember	327
Table 518 – Association ends of ReferenceData:: CombinedCycleConfigurationMember with other classes	327
Table 519 – Attributes of ReferenceData::CombinedCycleLogicalConfiguration	328
Table 520 – Association ends of ReferenceData:: CombinedCycleLogicalConfiguration with other classes	328
Table 521 – Attributes of ReferenceData::CombinedCycleTransitionState	328
Table 522 – Association ends of ReferenceData:: CombinedCycleTransitionState with other classes	329
Table 523 – Attributes of ReferenceData::CongestionArea	329
Table 524 – Association ends of ReferenceData::CongestionArea with other classes	329
Table 525 – Attributes of ReferenceData::ContractDistributionFactor	330
Table 526 – Association ends of ReferenceData:: ContractDistributionFactor with other classes	330
Table 527 – Attributes of ReferenceData::ContractRight	331
Table 528 – Association ends of ReferenceData::ContractRight with other classes	332
Table 529 – Attributes of ReferenceData::ControlAreaDesignation	332
Table 530 – Association ends of ReferenceData:: ControlAreaDesignation with other classes	333
Table 531 – Attributes of ReferenceData::Flowgate	333
Table 532 – Association ends of ReferenceData::Flowgate with other classes	333
Table 533 – Attributes of ReferenceData::FlowgatePartner	334
Table 534 – Association ends of ReferenceData::FlowgatePartner with other classes	334
Table 535 – Attributes of ReferenceData::FlowgateRelief	335
Table 536 – Association ends of ReferenceData::FlowgateRelief with other classes	335
Table 537 – Attributes of ReferenceData::FlowgateValue	335
Table 538 – Association ends of ReferenceData::FlowgateValue with other classes	336
Table 539 – Attributes of ReferenceData::ForbiddenRegion	336
Table 540 – Association ends of ReferenceData::ForbiddenRegion with other classes	336
Table 541 – Attributes of ReferenceData::FormerReference	337

Table 542 – Association ends of ReferenceData::FormerReference with other classes	337
Table 543 – Attributes of ReferenceData::FuelCostCurve	337
Table 544 – Association ends of ReferenceData::FuelCostCurve with other classes	338
Table 545 – Attributes of ReferenceData::FuelRegion	338
Table 546 – Association ends of ReferenceData::FuelRegion with other classes	338
Table 547 – Attributes of ReferenceData::GasPrice	339
Table 548 – Association ends of ReferenceData::GasPrice with other classes	339
Table 549 – Attributes of ReferenceData::HostControlArea	339
Table 550 – Association ends of ReferenceData::HostControlArea with other classes	339
Table 551 – Attributes of ReferenceData::IndividualPnode	340
Table 552 – Association ends of ReferenceData::IndividualPnode with other classes	340
Table 553 – Attributes of ReferenceData::LoadAggregationPoint	341
Table 554 – Association ends of ReferenceData:: LoadAggregationPoint with other classes	341
Table 555 – Attributes of ReferenceData::LoadRatio	342
Table 556 – Association ends of ReferenceData::LoadRatio with other classes	342
Table 557 – Attributes of ReferenceData::LocalReliabilityArea	342
Table 558 – Association ends of ReferenceData::LocalReliabilityArea with other classes	343
Table 559 – Attributes of ReferenceData::MPMTestCategory	343
Table 560 – Association ends of ReferenceData::MPMTestCategory with other classes	344
Table 561 – Attributes of ReferenceData::MPMTestThreshold	344
Table 562 – Association ends of ReferenceData::MPMTestThreshold with other classes	344
Table 563 – Attributes of ReferenceData::MSSAggregation	345
Table 564 – Association ends of ReferenceData::MSSAggregation with other classes	345
Table 565 – Attributes of ReferenceData::MSSZone	346
Table 566 – Association ends of ReferenceData::MSSZone with other classes	346
Table 567 – Attributes of ReferenceData::MarketPerson	347
Table 568 – Association ends of ReferenceData::MarketPerson with other classes	348
Table 569 – Attributes of ReferenceData::MarketQualificationRequirement	348
Table 570 – Association ends of ReferenceData:: MarketQualificationRequirement with other classes	349
Table 571 – Attributes of ReferenceData::MarketRegion	349
Table 572 – Association ends of ReferenceData::MarketRegion with other classes	349
Table 573 – Attributes of ReferenceData::MarketSkill	350
Table 574 – Association ends of ReferenceData::MarketSkill with other classes	350
Table 575 – Attributes of ReferenceData::MaxStartUpCostCurve	351
Table 576 – Association ends of ReferenceData:: MaxStartUpCostCurve with other classes	351
Table 577 – Attributes of ReferenceData::MeteredSubSystem	352
Table 578 – Association ends of ReferenceData::MeteredSubSystem with other classes	352
Table 579 – Attributes of ReferenceData::MktCombinedCyclePlant	352

Table 580 – Association ends of ReferenceData:: MktCombinedCyclePlant with other classes	353
Table 581 – Attributes of ReferenceData::MktConductingEquipment.....	353
Table 582 – Association ends of ReferenceData:: MktConductingEquipment with other classes	354
Table 583 – Attributes of ReferenceData::MktContingency.....	354
Table 584 – Association ends of ReferenceData::MktContingency with other classes	355
Table 585 – Attributes of ReferenceData::MktHeatRateCurve	355
Table 586 – Association ends of ReferenceData::MktHeatRateCurve with other classes	356
Table 587 – Attributes of ReferenceData::MktThermalGeneratingUnit.....	356
Table 588 – Association ends of ReferenceData:: MktThermalGeneratingUnit with other classes	357
Table 589 – Attributes of ReferenceData::OilPrice	358
Table 590 – Association ends of ReferenceData::OilPrice with other classes	358
Table 591 – Attributes of ReferenceData::OrgPnodeAllocation.....	359
Table 592 – Association ends of ReferenceData::OrgPnodeAllocation with other classes	359
Table 593 – Attributes of ReferenceData::OrgResOwnership	359
Table 594 – Association ends of ReferenceData::OrgResOwnership with other classes	360
Table 595 – Attributes of ReferenceData::Pnode	360
Table 596 – Association ends of ReferenceData::Pnode with other classes	360
Table 597 – Attributes of ReferenceData::PnodeDistributionFactor	361
Table 598 – Association ends of ReferenceData:: PnodeDistributionFactor with other classes	361
Table 599 – Attributes of ReferenceData::RMRHeatRateCurve	362
Table 600 – Association ends of ReferenceData::RMRHeatRateCurve with other classes	362
Table 601 – Attributes of ReferenceData::RMRStartUpCostCurve.....	362
Table 602 – Association ends of ReferenceData:: RMRStartUpCostCurve with other classes	363
Table 603 – Attributes of ReferenceData::RMRStartUpEnergyCurve.....	363
Table 604 – Association ends of ReferenceData:: RMRStartUpEnergyCurve with other classes	364
Table 605 – Attributes of ReferenceData::RMRStartUpFuelCurve	364
Table 606 – Association ends of ReferenceData:: RMRStartUpFuelCurve with other classes	365
Table 607 – Attributes of ReferenceData::RMRStartUpTimeCurve	365
Table 608 – Association ends of ReferenceData:: RMRStartUpTimeCurve with other classes	366
Table 609 – Attributes of ReferenceData::RTO	366
Table 610 – Association ends of ReferenceData::RTO with other classes	366
Table 611 – Attributes of ReferenceData::RUCZone	367
Table 612 – Association ends of ReferenceData::RUCZone with other classes	368
Table 613 – Attributes of ReferenceData::RegisteredDistributedResource	368
Table 614 – Association ends of ReferenceData:: RegisteredDistributedResource with other classes	369

Table 615 – Attributes of ReferenceData::RegisteredGenerator	371
Table 616 – Association ends of ReferenceData:: RegisteredGenerator with other classes	374
Table 617 – Attributes of ReferenceData::RegisteredInterTie	376
Table 618 – Association ends of ReferenceData::RegisteredInterTie with other classes	377
Table 619 – Attributes of ReferenceData::RegisteredLoad	379
Table 620 – Association ends of ReferenceData::RegisteredLoad with other classes	380
Table 621 – Attributes of ReferenceData::RegulatingLimit	381
Table 622 – Association ends of ReferenceData::RegulatingLimit with other classes	381
Table 623 – Attributes of ReferenceData::ResourceCertification	382
Table 624 – Association ends of ReferenceData:: ResourceCertification with other classes	382
Table 625 – Attributes of ReferenceData::ResourceOperationMaintenanceCost.....	382
Table 626 – Association ends of ReferenceData:: ResourceOperationMaintenanceCost with other classes	383
Table 627 – Attributes of ReferenceData::ResourceStartupCost	383
Table 628 – Association ends of ReferenceData:: ResourceStartupCost with other classes	384
Table 629 – Association ends of ReferenceData:: ResourceVerifiableCosts with other classes	384
Table 630 – Attributes of ReferenceData::ResponseMethod	385
Table 631 – Association ends of ReferenceData::ResponseMethod with other classes	385
Table 632 – Attributes of ReferenceData::SchedulingCoordinator	386
Table 633 – Association ends of ReferenceData:: SchedulingCoordinator with other classes	386
Table 634 – Attributes of ReferenceData::SchedulingCoordinatorUser	387
Table 635 – Attributes of ReferenceData::SchedulingPoint	387
Table 636 – Association ends of ReferenceData::SchedulingPoint with other classes	387
Table 637 – Attributes of ReferenceData::StartUpEnergyCurve.....	388
Table 638 – Association ends of ReferenceData::StartUpEnergyCurve with other classes	388
Table 639 – Attributes of ReferenceData::StartUpFuelCurve.....	389
Table 640 – Association ends of ReferenceData::StartUpFuelCurve with other classes	389
Table 641 – Attributes of ReferenceData::SubControlArea.....	389
Table 642 – Association ends of ReferenceData::SubControlArea with other classes.....	390
Table 643 – Attributes of ReferenceData::SubstitutionResourceList.....	391
Table 644 – Association ends of ReferenceData:: SubstitutionResourceList with other classes	391
Table 645 – Attributes of ReferenceData::TACArea	391
Table 646 – Association ends of ReferenceData::TACArea with other classes	391
Table 647 – Attributes of ReferenceData::TransmissionRightChain.....	392
Table 648 – Association ends of ReferenceData:: TransmissionRightChain with other classes	392
Table 649 – Attributes of ReferenceData::WheelingCounterParty.....	392
Table 650 – Association ends of ReferenceData:: WheelingCounterParty with other classes	393

Table 651 – Attributes of Environmental::AlertTypeList	403
Table 652 – Association ends of Environmental::AlertTypeList with other classes	403
Table 653 – Attributes of Environmental::AtmosphericAnalog	403
Table 654 – Association ends of Environmental::AtmosphericAnalog with other classes	404
Table 655 – Attributes of Environmental::AtmosphericPhenomenon	404
Table 656 – Association ends of Environmental:: AtmosphericPhenomenon with other classes	404
Table 657 – Attributes of Environmental::ClassificationCondition	405
Table 658 – Association ends of Environmental:: ClassificationCondition with other classes	405
Table 659 – Attributes of Environmental::CloudCondition	405
Table 660 – Association ends of Environmental::CloudCondition with other classes	406
Table 661 – Attributes of Environmental::Cyclone	406
Table 662 – Association ends of Environmental::Cyclone with other classes	407
Table 663 – Attributes of Environmental::Earthquake	407
Table 664 – Association ends of Environmental::Earthquake with other classes	407
Table 665 – Attributes of Environmental::EnvironmentalAnalog	408
Table 666 – Association ends of Environmental:: EnvironmentalAnalog with other classes	408
Table 667 – Attributes of Environmental::EnvironmentalAlert	409
Table 668 – Association ends of Environmental::EnvironmentalAlert with other classes	409
Table 669 – Attributes of Environmental::EnvironmentalCodedValue	410
Table 670 – Association ends of Environmental:: EnvironmentalCodedValue with other classes	410
Table 671 – Attributes of Environmental::EnvironmentalDataAuthority	411
Table 672 – Association ends of Environmental:: EnvironmentalDataAuthority with other classes	411
Table 673 – Attributes of Environmental::EnvironmentalDataProvider	411
Table 674 – Association ends of Environmental:: EnvironmentalDataProvider with other classes	412
Table 675 – Attributes of Environmental::EnvironmentalDiscrete	412
Table 676 – Association ends of Environmental:: EnvironmentalDiscrete with other classes	413
Table 677 – Attributes of Environmental::EnvironmentalEvent	413
Table 678 – Association ends of Environmental::EnvironmentalEvent with other classes	414
Table 679 – Attributes of Environmental::EnvironmentalInformation	414
Table 680 – Association ends of Environmental:: EnvironmentalInformation with other classes	414
Table 681 – Attributes of Environmental::EnvironmentalLocationType	415
Table 682 – Association ends of Environmental:: EnvironmentalLocationType with other classes	415
Table 683 – Attributes of Environmental::EnvironmentalPhenomenon	415
Table 684 – Association ends of Environmental:: EnvironmentalPhenomenon with other classes	416
Table 685 – Attributes of Environmental::EnvironmentalStringMeasurement	416

Table 686 – Association ends of Environmental::EnvironmentalStringMeasurement with other classes	416
Table 687 – Attributes of Environmental::Fire	417
Table 688 – Association ends of Environmental::Fire with other classes	417
Table 689 – Attributes of Environmental::Flood	417
Table 690 – Association ends of Environmental::Flood with other classes	417
Table 691 – Attributes of Environmental::Forecast	418
Table 692 – Association ends of Environmental::Forecast with other classes	418
Table 693 – Attributes of Environmental::GeosphericAnalog	419
Table 694 – Association ends of Environmental::GeosphericAnalog with other classes	419
Table 695 – Attributes of Environmental::GeosphericPhenomenon	420
Table 696 – Association ends of Environmental::GeosphericPhenomenon with other classes	420
Table 697 – Attributes of Environmental::Hurricane	420
Table 698 – Association ends of Environmental::Hurricane with other classes	421
Table 699 – Attributes of Environmental::HydrosphericAnalog	421
Table 700 – Association ends of Environmental::HydrosphericAnalog with other classes	421
Table 701 – Attributes of Environmental::HydrosphericPhenomenon	422
Table 702 – Association ends of Environmental::HydrosphericPhenomenon with other classes	422
Table 703 – Attributes of Environmental::Landslide	422
Table 704 – Association ends of Environmental::Landslide with other classes	423
Table 705 – Attributes of Environmental::LightningStrike	423
Table 706 – Association ends of Environmental::LightningStrike with other classes	423
Table 707 – Attributes of Environmental::MagneticStorm	424
Table 708 – Association ends of Environmental::MagneticStorm with other classes	424
Table 709 – Attributes of Environmental::Observation	424
Table 710 – Association ends of Environmental::Observation with other classes	424
Table 711 – Attributes of Environmental::PhenomenonClassification	425
Table 712 – Association ends of Environmental::PhenomenonClassification with other classes	425
Table 713 – Attributes of Environmental::ReportingCapability	426
Table 714 – Association ends of Environmental::ReportingCapability with other classes	426
Table 715 – Attributes of Environmental::SpaceAnalog	426
Table 716 – Association ends of Environmental::SpaceAnalog with other classes	427
Table 717 – Attributes of Environmental::SpacePhenomenon	427
Table 718 – Association ends of Environmental::SpacePhenomenon with other classes	427
Table 719 – Attributes of Environmental::Tornado	428
Table 720 – Association ends of Environmental::Tornado with other classes	428
Table 721 – Attributes of Environmental::TropicalCycloneAustralia	428
Table 722 – Association ends of Environmental::TropicalCycloneAustralia with other classes	429
Table 723 – Attributes of Environmental::Tsunami	429
Table 724 – Association ends of Environmental::Tsunami with other classes	429

Table 725 – Attributes of Environmental::VolcanicAshCloud	430
Table 726 – Association ends of Environmental::VolcanicAshCloud with other classes	430
Table 727 – Attributes of Environmental::Whirlpool	430
Table 728 – Association ends of Environmental::Whirlpool with other classes	431
Table 729 – Attributes of EnvDomain::RelativeDisplacement	431
Table 730 – Literals of EnvDomain::AtmosphericAnalogKind	432
Table 731 – Literals of EnvDomain::CloudKind	433
Table 732 – Literals of EnvDomain::CoverageCodeKind	433
Table 733 – Literals of EnvDomain::EnvironmentalDiscreteKind	434
Table 734 – Literals of EnvDomain::FScale	434
Table 735 – Literals of EnvDomain::GeosphericAnalogKind	434
Table 736 – Literals of EnvDomain::HydrosphericAnalogKind	435
Table 737 – Literals of EnvDomain::IntensityCodeKind	435
Table 738 – Literals of EnvDomain::LocationKind	435
Table 739 – Literals of EnvDomain::RelativeDisplacementKind	436
Table 740 – Literals of EnvDomain::SpaceAnalogKind	436
Table 741 – Literals of EnvDomain::TestKind	436
Table 742 – Literals of EnvDomain::TimePeriodUnit	436
Table 743 – Literals of EnvDomain::ReportingMethodKind	437
Table 744 – Literals of EnvDomain::UncertaintyKind	437
Table 745 – Literals of EnvDomain::WeatherCodeKind	437
Table 746 – Attributes of EnvDomain::Bearing	438
Table 747 – Attributes of EnvDomain::MagneticField	438
Table 748 – Attributes of EnvDomain::ParticulateDensity	439

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –**Part 301: Common information model (CIM) extensions for markets****FOREWORD**

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International Standard IEC 62325-301 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

This second edition cancels and replaces the first edition published in 2014. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Environmental weather support
- b) Demand-side communication for North American markets
- c) Transparency regulations and flow-based market coupling along with network codes support for European Markets
- d) Registered resource updates.

The text of this standard is based on the following documents:

FDIS	Report on voting
57/1947/FDIS	57/1961/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

Throughout this document, references are made to the UML model. References to specific UML packages and classes are made by citing the name of package or class in single quotes, example, 'IEC 61970' or 'IdentifiedObject'.

A list of all parts of the IEC 62325 series, under the general title: *Framework for energy market communications*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This part of IEC 62325 is one of a series of standards for deregulated energy market data exchanges. This standard series was originally based upon the work of the European transmission system operators TF 14 EDI (Electronic data interchange) and the Electric Power Research Institute (EPRI) TR 1009455 and TR 1011431 (CIM extensions to support market operations, phase 1 and phase 2).

The principal objective of the IEC 62325 series is to produce standards which facilitate the integration of market application software developed independently by different vendors into a market management system, as well as integration of market management systems and market participant systems. This is accomplished by defining message exchanges to enable these applications or systems to access public data and exchange information independent of how such information is represented internally.

The common information model (CIM) specifies the basis for the semantics for this message exchange. The profile specifications, which are contained in other parts of IEC 62325, specify the content of the messages exchanged. Profile specifications in other parts of IEC 62325 support both European style markets based on the European regulations, Third Party Access and zonal market concepts, and North American style markets characterized by day ahead unit commitment by a market operator, intraday and real time balancing through central dispatch, and settlement based on locational marginal prices. These markets are used in the US and in other parts of the world and are not exclusively limited to North America.

The CIM is an abstract model that represents all the major objects in an electric utility enterprise typically needed to model the operational aspects of a utility. This model includes public classes and attributes for these objects, as well as the relationships between them.

The IEC 62325 series are part of a series of standards dealing with the CIM. IEC 61970 defines the EMS application programming interfaces and IEC 61968 defines System interfaces for distribution management. IEC 62325-301 corresponds to IEC 61970-301 and IEC 61968-11 which describe parts of the common information model relevant to modeling interfaces for EMS, DMS and MMS systems. While there are multiple IEC standard series dealing with different parts of the CIM, there is a single, unified information model comprising the CIM behind all these individual standard series.

FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –

Part 301: Common information model (CIM) extensions for markets

1 Scope

This part of IEC 62325 specifies the common information model (CIM) for energy market communications.

The CIM is an abstract model that represents all the major objects in an electric utility enterprise typically involved in utility operations and electricity market management. By providing a standard way of representing power system resources as object classes and attributes, along with their relationships, the CIM facilitates the integration of market management system (MMS) applications developed independently by different vendors, between entire MMS systems developed independently, or between an MMS system and other systems concerned with different aspects of market management, such as capacity allocation, day-ahead management, balancing, settlement, etc.

The CIM facilitates integration by defining a common language (i.e. semantics) based on the CIM to enable these applications or systems to access public data and exchange information independent of how such information is represented internally.

The object classes represented in the CIM are abstract in nature and may be used in a wide variety of applications. The use of the CIM goes far beyond its application in a market management system.

Due to the size of the complete CIM, the object classes contained in the CIM are grouped into a number of logical packages, each of which represents a certain part of the overall power system being modeled. Collections of these packages are progressed as separate international standards. This particular document specifies a set of packages which provide a logical view of the functional aspects of market management within an electricity market, and other functional aspects including environmental aspects that are closely related to electricity markets and that are shared between all applications. Other standards specify more specific parts of the model that are needed by only certain applications. Subclause 4.2 provides the current grouping of packages into standards documents.

This new edition of IEC 62325-301 contains support for demand-side communication within a wholesale market. The IEC 62325-301 additions include support for demand-side resource registration and enrollment of a market participating resource as well as support for deployment and performance evaluation of demand side resources. A new package has been included in this edition of IEC 62325-301 to support environmental (weather) data. This new package 'Environmental' provides support for weather conditions including forecasts, observations, measurements, phenomena, and alerts. Additional updates have been added within the 'MarketManagement' package to support the transparency regulations, flow based market coupling and new network codes to support the European Markets. These updates include new classes, attributes and associations within the IEC 62325 packages as well as updates to existing classes, attributes and associations to accurately represent the existing use cases.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61968-11, *Application integration at electric utilities – System interfaces for distribution management – Part 11: Common information model (CIM) extensions for distribution*

IEC TS 61970-2:2004, *Energy management system application program interface (EMS-API) – Part 2: Glossary*

IEC 61970-301, *Energy management system application program interface (EMS-API) – Part 301: Common information model (CIM) base*

IEC 61970-302, *Energy management system application program interface (EMS-API) – Part 302: Common information model (CIM) for dynamics*

IEC 62325-450, *Framework for energy market communications – Part 450: Profile and context modelling rules*

Object management group: *UML 2.0 specification* – available at <<http://www.omg.org>>

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms and definitions given in IEC TS 61970-2 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1 Terms and definitions

3.1.1

application program interface

API

set of public functions provided by an executable application component for use by other executable application components

[SOURCE: IEC 61970-2:2004, 3.4]

3.1.2

extensible markup language

XML

markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable

3.1.3

XML schema description

XSD

XML-based language used to describe and control XML document contents