



European Network of  
Transmission System Operators  
for Electricity

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# CSA RELATED CANONICAL EXTENSIONS SPECIFICATION

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2021-04-21

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SOC APPROVED  
VERSION 1.0

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32

33

## Revision History

Version	Release	Date	Paragraph	Comments
1	0	2021-04-21		Approved by SOC.

34

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## 246 1 Introduction

247 This document describes CIM extensions that were designed for the purpose of coordinated  
248 security analysis exchanges. The set of profiles which use these extensions could be applied  
249 for other exchanges too. Therefore, the objective is to propose these extensions for appropriate  
250 standardisation in IEC.

251 The Coordinated Security Assessment data exchange specification by ENTSO-E shall be used  
252 as a reference in order to understand the context, use cases and the terms and definitions  
253 considered while designing the canonical extensions.

## 254 2 Coordinated security analysis extensions

### 255 2.1 General

256 This package contains the extensions defined for the need of Coordinated Security Analysis  
257 (CSA) data exchanges.

### 258 2.2 (CSA) ExtCoordinatedSecurityAnalysisCIMVersion root class

259 The version information assigned to the extensions defined for the need of Coordinated Security  
260 Analysis (CSA) data exchanges.

261 Table 1 shows all attributes of ExtCoordinatedSecurityAnalysisCIMVersion.

262 **Table 1 – Attributes of**  
263 **ExtCoordinatedSecurityAnalysis::ExtCoordinatedSecurityAnalysisCIMVersion**

name	mult	type	description
date	0..1	Date	(const=2021-03-22) Date of the last canonical model update. Form is YYYY-MM-DD. For example, for 5 January 2009 it is 2009-01-05.
version	0..1	String	(const=1.0) European namespace URI. The last two elements in the URI ( <a href="http://iec.ch/TC57/CIM100-EuropeanExtension/yy/zzz#">http://iec.ch/TC57/CIM100-EuropeanExtension/yy/zzz#</a> ) indicate major and minor versions where: - yy - indicates a major version; - zzz - indicates a minor version.

264

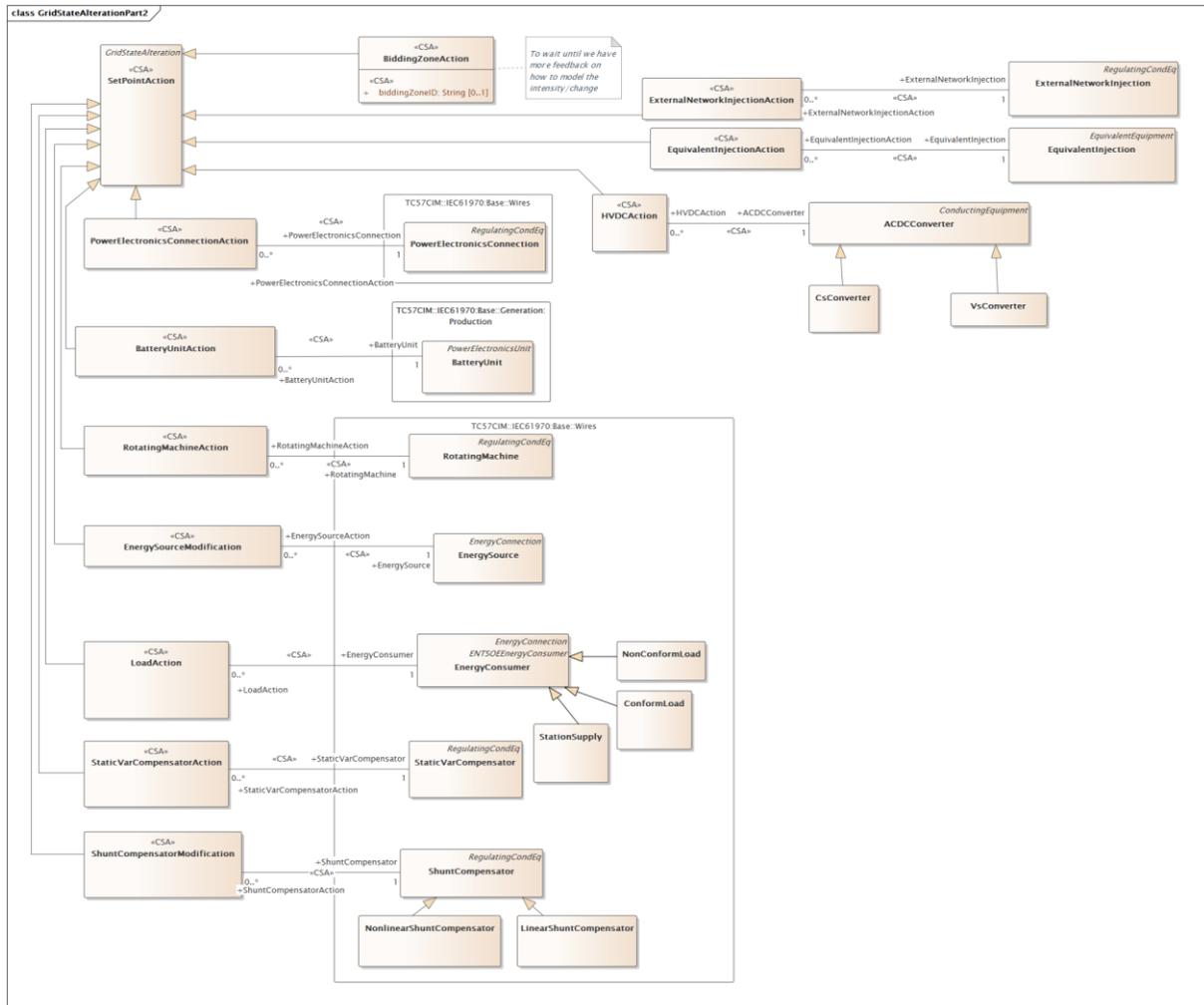
### 265 2.3 Remedial action extensions

#### 266 2.3.1 General

267 This package contains the extensions related to the remedial action.

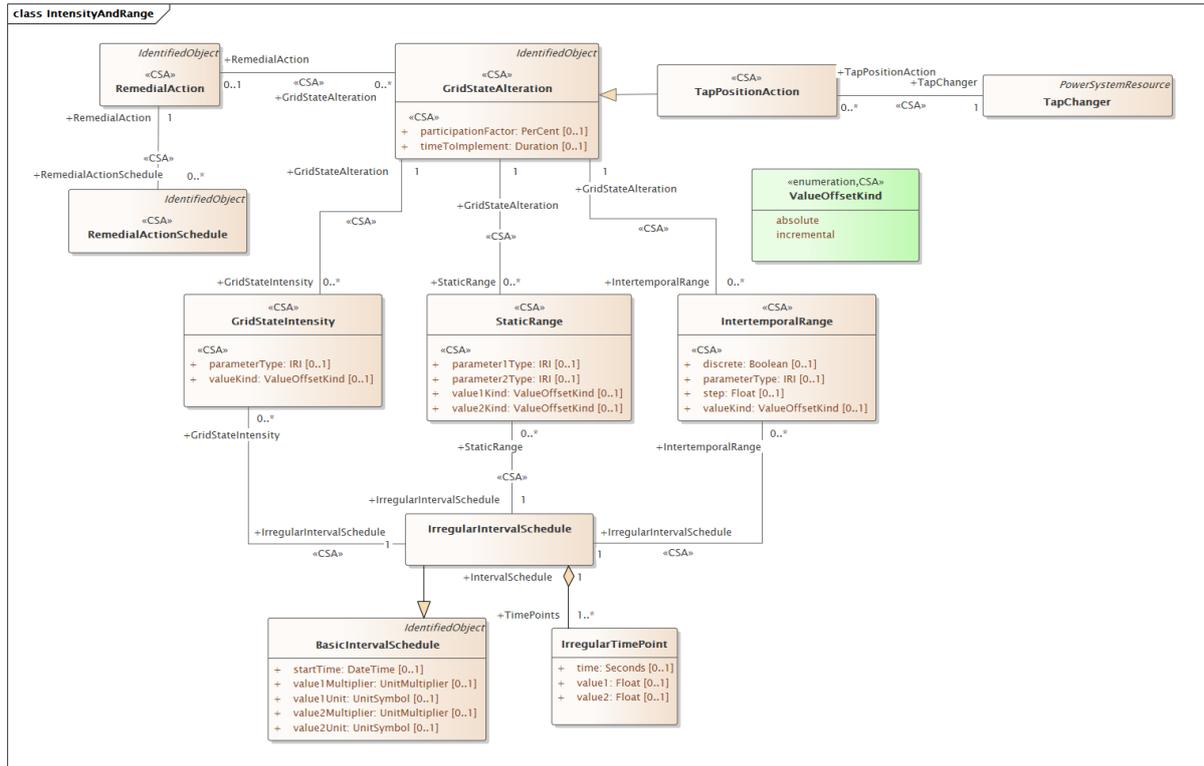


273 Figure 2: This diagram contains extended classes for the purpose of the remedial action data  
274 exchange.



275  
276 **Figure 3 – Class diagram ExtRemedialAction::GridStateAlterationPart2**

277 Figure 3: This diagram contains extended classes for the purpose of the remedial action data  
278 exchange.



279

280

**Figure 4 – Class diagram ExtRemedialAction::IntensityAndRange**

281 Figure 4: This diagram contains extended classes related to the modelling of static, dynamic  
282 ranges and intensity.

283 **2.3.2 (CSA) RotatingMachineAction**

284 Inheritance path = [SetPointAction](#) : [GridStateAlteration](#) : IdentifiedObject :  
285 ExtEulIdentifiedObject

286 Rotating machine action.

287 Table 2 shows all attributes of RotatingMachineAction.

288

**Table 2 – Attributes of ExtRemedialAction::RotatingMachineAction**

name	mult	type	description
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

289

290 Table 3 shows all association ends of RotatingMachineAction with other classes.

291 **Table 3 – Association ends of ExtRemedialAction::RotatingMachineAction with other**  
292 **classes**

mult from	name	mult to	type	description
0..*	RotatingMachine	1..1	RotatingMachine	(CSA) The rotating machine that has an action.
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

293

### 294 2.3.3 (CSA) BatteryUnitAction

295 Inheritance path = [SetPointAction](#) : [GridStateAlteration](#) : IdentifiedObject :  
296 ExtEulIdentifiedObject

297 Battery unit setpoint action.

298 Table 4 shows all attributes of BatteryUnitAction.

299

**Table 4 – Attributes of ExtRemedialAction::BatteryUnitAction**

name	mult	type	description
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

300

301 Table 5 shows all association ends of BatteryUnitAction with other classes.

302 **Table 5 – Association ends of ExtRemedialAction::BatteryUnitAction with other classes**

mult from	name	mult to	type	description
0..*	BatteryUnit	1..1	BatteryUnit	(CSA) The BatteryUnit that is associated with an action.
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>

mult from	name	mult to	type	description
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

303

304 **2.3.4 (CSA) BiddingZoneAction**

305 Inheritance path = [SetPointAction](#) : [GridStateAlteration](#) : IdentifiedObject :  
306 ExtEulIdentifiedObject

307 Bidding zone setpoint action. Mostly used for describing countertrading kind of grid state  
308 alteration.

309 Table 6 shows all attributes of BiddingZoneAction.

310

**Table 6 – Attributes of ExtRemedialAction::BiddingZoneAction**

name	mult	type	description
biddingZoneID	0..1	String	(CSA) The identifier of the bidding zone to which this action is applied.
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

311

312 Table 7 shows all association ends of BiddingZoneAction with other classes.

313

**Table 7 – Association ends of ExtRemedialAction::BiddingZoneAction with other classes**

314

mult from	name	mult to	type	description
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

315

316 **2.3.5 (CSA) RegulatingControlAction**

317 Inheritance path = [GridStateAlteration](#) : IdentifiedObject : ExtEulIdentifiedObject

318 Control action means the set point change of a regulating control power system resource in the  
319 grid model compared to the base case.

320 Table 8 shows all attributes of RegulatingControlAction.

321

**Table 8 – Attributes of ExtRemedialAction::RegulatingControlAction**

name	mult	type	description
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

322

323

Table 9 shows all association ends of RegulatingControlAction with other classes.

324

**Table 9 – Association ends of ExtRemedialAction::RegulatingControlAction with other classes**

325

mult from	name	mult to	type	description
0..*	RegulatingControl	1..1	RegulatingControl	(CSA) The regulating control which has an action.
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

326

### 2.3.6 (CSA) EquivalentInjectionAction

Inheritance path = [SetPointAction](#) : [GridStateAlteration](#) : IdentifiedObject :

ExtEulIdentifiedObject

Equivalent injection action.

Table 10 shows all attributes of EquivalentInjectionAction.

332

**Table 10 – Attributes of ExtRemedialAction::EquivalentInjectionAction**

name	mult	type	description
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

333

334 Table 11 shows all association ends of EquivalentInjectionAction with other classes.

335 **Table 11 – Association ends of ExtRemedialAction::EquivalentInjectionAction with**  
336 **other classes**

mult from	name	mult to	type	description
0..*	EquivalentInjection	1..1	EquivalentInjection	(CSA) The EquivalentInjection that is associated with an action.
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

337

338 **2.3.7 (CSA) ExternalNetworkInjectionAction**

339 Inheritance path = [SetPointAction](#) : [GridStateAlteration](#) : IdentifiedObject :  
340 ExtEulIdentifiedObject

341 External network injection action.

342 Table 12 shows all attributes of ExternalNetworkInjectionAction.

343 **Table 12 – Attributes of ExtRemedialAction::ExternalNetworkInjectionAction**

name	mult	type	description
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

344

345 Table 13 shows all association ends of ExternalNetworkInjectionAction with other classes.

346 **Table 13 – Association ends of ExtRemedialAction::ExternalNetworkInjectionAction**  
347 **with other classes**

mult from	name	mult to	type	description
0..*	ExternalNetworkInjection	1..1	ExternalNetworkInjection	(CSA) The ExternalNetworkInjection that is associated with an action.
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>

mult from	name	mult to	type	description
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

348

### 349 2.3.8 (CSA) EnergySourceModification

350 Inheritance path = [SetPointAction](#) : [GridStateAlteration](#) : IdentifiedObject :

351 ExtEulIdentifiedObject

352 Energy source action.

353 Table 14 shows all attributes of EnergySourceModification.

#### 354 Table 14 – Attributes of ExtRemedialAction::EnergySourceModification

name	mult	type	description
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

355

356 Table 15 shows all association ends of EnergySourceModification with other classes.

#### 357 Table 15 – Association ends of ExtRemedialAction::EnergySourceModification with 358 other classes

mult from	name	mult to	type	description
0..*	EnergySource	1..1	EnergySource	(CSA) The EnergySource which is associated with an EnergySourceAction.
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

359

### 360 2.3.9 (CSA) GridStateAlteration

361 Inheritance path = IdentifiedObject : ExtEulIdentifiedObject

362 Grid state alteration is a change of values of one element in the grid model compared to the  
363 base case.

364 Table 16 shows all attributes of GridStateAlteration.

365

**Table 16 – Attributes of ExtRemedialAction::GridStateAlteration**

name	mult	type	description
timeToImplement	0..1	Duration	(CSA) Time to implement a grid state alteration.
participationFactor	0..1	PerCent	(CSA) It defines the participation of this grid state alteration. If 0 this grid alteration does not participate. The sum of all participation factors for all grid state alterations associated with same remedial action shall be equal to 100%. In cases where only one remedial action is associated with one grid state alteration, the participation factor shall be equal to 100%.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

366

367

Table 17 shows all association ends of GridStateAlteration with other classes.

368

**Table 17 – Association ends of ExtRemedialAction::GridStateAlteration with other classes**

369

mult from	name	mult to	type	description
0..*	Contingency	0..1	Contingency	(CSA) The contingency to which this grid state alteration is included.
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) The contingency element that are part of the grid state alteration.
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) The remedial action associated with a given grid state alteration.
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) The StaticRange associated with a given GridStateAlteration.
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) The intertemporal range associated with a given grid state alteration.
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) The intensity associated with a given GridStateAlteration.
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

370

**2.3.10 (CSA) HVDCAction**

Inheritance path = [SetPointAction](#) : [GridStateAlteration](#) : IdentifiedObject :

ExtEulIdentifiedObject

HVDC action.

Table 18 shows all attributes of HVDCAction.

376

**Table 18 – Attributes of ExtRemedialAction::HVDCAction**

name	mult	type	description
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

377

378 Table 19 shows all association ends of HVDCAction with other classes.

379

**Table 19 – Association ends of ExtRemedialAction::HVDCAction with other classes**

mult from	name	mult to	type	description
0..*	ACDCCConverter	1..1	ACDCCConverter	(CSA) The ACDCCConverter that is associated with an action.
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

380

**381 2.3.11 (CSA) LoadAction**382 Inheritance path = [SetPointAction](#) : [GridStateAlteration](#) : IdentifiedObject :

383 ExtEulIdentifiedObject

384 Load action.

385 Table 20 shows all attributes of LoadAction.

386

**Table 20 – Attributes of ExtRemedialAction::LoadAction**

name	mult	type	description
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

387

388 Table 21 shows all association ends of LoadAction with other classes.

389 **Table 21 – Association ends of ExtRemedialAction::LoadAction with other classes**

mult from	name	mult to	type	description
0..*	EnergyConsumer	1..1	EnergyConsumer	(CSA) The EnergyConsumer that is associated with a load action.
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

390

391 **2.3.12 (CSA) OutageAction**392 Inheritance path = [GridStateAlteration](#) : IdentifiedObject : ExtEulIdentifiedObject

393 Outage action.

394 Table 22 shows all attributes of OutageAction.

395

**Table 22 – Attributes of ExtRemedialAction::OutageAction**

name	mult	type	description
outageID	0..1	String	(CSA) The identifier of the outage.
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

396

397 Table 23 shows all association ends of OutageAction with other classes.

398 **Table 23 – Association ends of ExtRemedialAction::OutageAction with other classes**

mult from	name	mult to	type	description
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

399

400 **2.3.13 (CSA) PowerElectronicsConnectionAction**401 Inheritance path = [SetPointAction](#) : [GridStateAlteration](#) : IdentifiedObject :

402 ExtEulIdentifiedObject

403 Power electronics setpoint action.

404 Table 24 shows all attributes of PowerElectronicsConnectionAction.

405 **Table 24 – Attributes of ExtRemedialAction::PowerElectronicsConnectionAction**

name	mult	type	description
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

406

407 Table 25 shows all association ends of PowerElectronicsConnectionAction with other classes.

408 **Table 25 – Association ends of ExtRemedialAction::PowerElectronicsConnectionAction**  
409 **with other classes**

mult from	name	mult to	type	description
0..*	PowerElectronicsConnection	1..1	PowerElectronicsConnection	(CSA) The PowerElectronicsConnection that is applied to an action.
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

410

411 **2.3.14 (CSA) RemedialActionCostCharacteristic**

412 Inheritance path = Curve : IdentifiedObject : ExtEulIdentifiedObject

413 The cost characteristic for a remedial action.

414 Table 26 shows all attributes of RemedialActionCostCharacteristic.

415 **Table 26 – Attributes of ExtRemedialAction::RemedialActionCostCharacteristic**

name	mult	type	description
y1UnitNominator	0..1	Currency	(CSA) The nominator of the Y1-axis units of measure.
y1UnitDenominator	0..1	UnitSymbol	(CSA) The denominator of the Y1-axis units of measure.
y1UnitDenominatorMultiplier	0..1	UnitMultiplier	(CSA) The multiplier of the denominator of the Y1-axis units of measure.

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

416

417 Table 27 shows all association ends of RemedialActionCostCharacteristic with other classes.

418 **Table 27 – Association ends of ExtRemedialAction::RemedialActionCostCharacteristic**  
419 **with other classes**

mult from	name	mult to	type	description
0..1	RemedialAction	1..1	<a href="#">RemedialAction</a>	(CSA) The remedial action that has cost characteristic.
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

420

421 **2.3.15 (CSA) RemedialActionSchedule**

422 Inheritance path = IdentifiedObject : ExtEulIdentifiedObject

423 This is a schedule for a determined remedial action.

424 Table 28 shows all attributes of RemedialActionSchedule.

425 **Table 28 – Attributes of ExtRemedialAction::RemedialActionSchedule**

name	mult	type	description
statusKind	0..1	<a href="#">RemedialActionScheduleStatusKind</a>	(CSA) Indicates the status kind for the remedial action schedule.
totalCost	0..1	Float	(CSA) Total cost of the remedial action.
statusReason	0..1	String	(CSA) Description of reasoning for the status. For instance, in case of rejected remedial action, the reason for this rejection is described here.
totalCostCurrency	0..1	Currency	(CSA) The currency of the total cost.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject

name	mult	type	description
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

426

427 Table 29 shows all association ends of RemedialActionSchedule with other classes.

428 **Table 29 – Association ends of ExtRemedialAction::RemedialActionSchedule with other**  
429 **classes**

mult from	name	mult to	type	description
0..*	Contingency	0..1	Contingency	(CSA) The contingency for a curative remedial action schedule.
0..*	RemedialAction	1..1	<a href="#">RemedialAction</a>	(CSA) The remedial action that has a remedial action schedule associated.
0..1	OutcomeValue	0..*	<a href="#">OutcomeValue</a>	(CSA) The outcome value associated with a remedial action schedule.
0..*	ImpactedSystemOperator	0..*	<a href="#">SystemOperator</a>	(CSA) Impacted system operator related to remedial action schedule.
0..1	RemedialActionScheduleAcceptance	0..*	<a href="#">RemedialActionScheduleAcceptance</a>	(CSA) The remedial action schedule acceptance related to a remedial action schedule.
0..*	RelevantRegion	0..1	<a href="#">Region</a>	(CSA) The relevant region for this remedial action schedule.
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

430

431 **2.3.16 (CSA) SetPointAction**432 Inheritance path = [GridStateAlteration](#) : IdentifiedObject : ExtEulIdentifiedObject

433 Setpoint action.

434 Table 30 shows all attributes of SetPointAction.

435 **Table 30 – Attributes of ExtRemedialAction::SetPointAction**

name	mult	type	description
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

436

437 Table 31 shows all association ends of SetPointAction with other classes.

438 **Table 31 – Association ends of ExtRemedialAction::SetPointAction with other classes**

mult from	name	mult to	type	description
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

439

440 **2.3.17 (CSA) ShuntCompensatorModification**

441 Inheritance path = [SetPointAction](#) : [GridStateAlteration](#) : IdentifiedObject :  
442 ExtEulIdentifiedObject

443 Shunt compensator action.

444 Table 32 shows all attributes of ShuntCompensatorModification.

445 **Table 32 – Attributes of ExtRemedialAction::ShuntCompensatorModification**

name	mult	type	description
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

446

447 Table 33 shows all association ends of ShuntCompensatorModification with other classes.

448 **Table 33 – Association ends of ExtRemedialAction::ShuntCompensatorModification**  
449 **with other classes**

mult from	name	mult to	type	description
0..*	ShuntCompensator	1..1	ShuntCompensator	(CSA) The ShuntCompensator that is associated with an action.
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

450

451 **2.3.18 (CSA) StaticVarCompensatorAction**452 Inheritance path = [SetPointAction](#) : [GridStateAlteration](#) : IdentifiedObject :  
453 ExtEulIdentifiedObject

454 Static Var compensator action.

455 Table 34 shows all attributes of StaticVarCompensatorAction.

456 **Table 34 – Attributes of ExtRemedialAction::StaticVarCompensatorAction**

name	mult	type	description
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

457

458 Table 35 shows all association ends of StaticVarCompensatorAction with other classes.

459 **Table 35 – Association ends of ExtRemedialAction::StaticVarCompensatorAction with**  
460 **other classes**

mult from	name	mult to	type	description
0..*	StaticVarCompensator	1..1	StaticVarCompensator	(CSA) The StaticVarCompensator which is associated with an action.
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

461

462 **2.3.19 (CSA) TapPositionAction**463 Inheritance path = [GridStateAlteration](#) : IdentifiedObject : ExtEulIdentifiedObject464 Tap position action represents a change of a tap changer position in the grid model compared  
465 to the base case.

466 Table 36 shows all attributes of TapPositionAction.

467 **Table 36 – Attributes of ExtRemedialAction::TapPositionAction**

name	mult	type	description
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>
aliasName	0..1	String	inherited from: IdentifiedObject

name	mult	type	description
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

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470  
471

Table 37 shows all association ends of TapPositionAction with other classes.

**Table 37 – Association ends of ExtRemedialAction::TapPositionAction with other classes**

mult from	name	mult to	type	description
0..*	TapChanger	1..1	TapChanger	(CSA) The tap changer that has a tap position action associated.
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

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476  
477  
478

**2.3.20 (CSA) TopologyAction**

Inheritance path = [GridStateAlteration](#) : IdentifiedObject : ExtEulIdentifiedObject  
Topology action means the connection or disconnection of a switch in the grid model compared to the base case.

Table 38 shows all attributes of TopologyAction.

**Table 38 – Attributes of ExtRemedialAction::TopologyAction**

name	mult	type	description
timeToImplement	0..1	Duration	(CSA) inherited from: <a href="#">GridStateAlteration</a>
participationFactor	0..1	PerCent	(CSA) inherited from: <a href="#">GridStateAlteration</a>
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

479  
480

Table 39 shows all association ends of TopologyAction with other classes.

481 **Table 39 – Association ends of ExtRemedialAction::TopologyAction with other classes**

mult from	name	mult to	type	description
0..*	Switch	1..1	Switch	(CSA) The switch that has a topology action associated.
0..*	Contingency	0..1	Contingency	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	ContingencyElement	0..*	ContingencyElement	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	StaticRange	0..*	<a href="#">StaticRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	IntertemporalRange	0..*	<a href="#">IntertemporalRange</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
1..1	GridStateIntensity	0..*	<a href="#">GridStateIntensity</a>	(CSA) inherited from: <a href="#">GridStateAlteration</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

482

483 **2.3.21 (CSA) RemedialAction**

484 Inheritance path = IdentifiedObject : ExtEulIdentifiedObject

485 A remedial action is described by one of many grid state alterations applied to a grid model  
486 state or particular scenario in order to resolve one or more Identified constraints. Only costly  
487 remedial actions require a cost characteristic.

488 Table 40 shows all attributes of RemedialAction.

489

**Table 40 – Attributes of ExtRemedialAction::RemedialAction**

name	mult	type	description
kind	0..1	<a href="#">RemedialActionKind</a>	(CSA) The kind of the remedial action.
available	0..1	Boolean	(CSA) It identifies if the remedial action is available. (True-Available/False-Unavailable).
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

490

491 Table 41 shows all association ends of RemedialAction with other classes.

492 **Table 41 – Association ends of ExtRemedialAction::RemedialAction with other classes**

mult from	name	mult to	type	description
0..1	GridStateAlteration	0..*	<a href="#">GridStateAlteration</a>	(CSA) The grid state alteration which is part of the remedial action.
1..1	RemedialActionSchedule	0..*	<a href="#">RemedialActionSchedule</a>	(CSA) The remedial action schedule associated with a remedial action, i.e. the assigning a schedule to a remedial action.
0..*	Contingency	0..*	Contingency	(CSA) The contingency that is associated with a remedial action, i.e. the contingency that is the cause for the creation of an remedial action and

mult from	name	mult to	type	description
				justifies it or would usually be resolved with a remedial action.
1..1	RemedialActionCostCharacteristic	0..1	<a href="#">RemedialActionCostCharacteristic</a>	(CSA) The remedial action cost characteristic that is associated with a remedial action.
0..1	OutcomeValue	0..*	<a href="#">OutcomeValue</a>	(CSA) The outcome value associated with a remedial action.
0..*	ConnectingSystemOperator	0..1	<a href="#">SystemOperator</a>	(CSA) System operator which are connected by remedial actions.
0..*	ConsideredInRegion	0..*	<a href="#">Region</a>	The region in which the remedial action is considered.
1..1	QualitativeRemedialActionThreshold	0..*	<a href="#">QualitativeRemedialActionThreshold</a>	(CSA) This is the qualitative threshold for a given remedial action.
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

493

494 **2.3.22 (CSA) RemedialActionScheduleStatusKind enumeration**

495 Remedial action schedule status kinds.

496 Table 42 shows all literals of RemedialActionScheduleStatusKind.

497 **Table 42 – Literals of ExtRemedialAction::RemedialActionScheduleStatusKind**

literal	value	description
proposed		Proposed remedial action schedule.
agreed		Agreed remedial action schedule.
rejected		Rejected remedial action schedule.
ordered		Ordered remedial action schedule.
previouslyAgreed		Previously agreed remedial action schedule.
notUsed		Not used remedial action schedule.
agreementValidated		The agreement is validated for the remedial action schedule.
rejectionValidated		The rejection is validated for the remedial action schedule.

498

499 **2.3.23 (CSA) StaticRange root class**

500 Defines the static range.

501 Table 43 shows all attributes of StaticRange.

502 **Table 43 – Attributes of ExtRemedialAction::StaticRange**

name	mult	type	description
parameter1Type	0..1	NullCIM	(CSA) Parameter type for IrregularTimePoint.value1.
value2Kind	0..1	<a href="#">ValueOffsetKind</a>	(CSA) The kind of the IrregularTimePoint.value2.
parameter2Type	0..1	IRI	(CSA) Parameter type for IrregularTimePoint.value2.
value1Kind	0..1	<a href="#">ValueOffsetKind</a>	(CSA) The kind of the IrregularTimePoint.value1.

503

504 Table 44 shows all association ends of StaticRange with other classes.

505 **Table 44 – Association ends of ExtRemedialAction::StaticRange with other classes**

mult from	name	mult to	type	description
0..*	GridStateAlteration	1..1	<a href="#">GridStateAlteration</a>	(CSA) The grid state alteration which has static range.
0..*	IrregularIntervalSchedule	1..1	IrregularIntervalSchedule	(CSA) The irregular interval schedule that associated with a static range.

506

507 **2.3.24 (CSA) IntertemporalRange root class**

508 It represents the intertemporal range, which means that this is the maximum change of an  
509 attribute value between two time stamps or per time unit (e.g. hour). Both up and down  
510 directions are defined. Value1 from the schedule is up direction and value2 is down direction.  
511 For instance, the value expressed by the GridStateIntensity class cannot be bigger than value1  
512 in up direction and cannot be bigger than value2 in down direction.

513 Table 45 shows all attributes of IntertemporalRange.

514 **Table 45 – Attributes of ExtRemedialAction::IntertemporalRange**

name	mult	type	description
parameterType	0..1	NullCIM	(CSA) Parameter type for value 1 and value 2 of the schedule.
valueKind	0..1	<a href="#">ValueOffsetKind</a>	(CSA) The kind of value1 and value2 for the schedule.
discrete	0..1	Boolean	(CSA) Indicates the mode of change between the operational value and values for up and down direction. If true, this is discrete change which requires attribute IntertemporalRange.step. If false, the change is continuous. In this case the attribute IntertemporalRange.step is not exchanged.
step	0..1	Float	(CSA) It defines the step of change. Used only when the IntertemporalRange.discrete is true.

515

516 Table 46 shows all association ends of IntertemporalRange with other classes.

517 **Table 46 – Association ends of ExtRemedialAction::IntertemporalRange with other classes**

518

mult from	name	mult to	type	description
0..*	GridStateAlteration	1..1	<a href="#">GridStateAlteration</a>	(CSA) The grid state alteration which has an intertemporal range.
0..*	IrregularIntervalSchedule	1..1	IrregularIntervalSchedule	(CSA) The irregular interval schedule associated with an intertemporal range.

519

520 **2.3.25 (CSA) ValueOffsetKind enumeration**

521 The kind of the value offset.

522 Table 47 shows all literals of ValueOffsetKind.

523 **Table 47 – Literals of ExtRemedialAction::ValueOffsetKind**

literal	value	description
absolute		Absolute value.

literal	value	description
incremental		Incremental value.

524

525 **2.3.26 (CSA) GridStateIntensity root class**

526 Defines the intensity applied for a given grid state alteration. It is primarily used in exchanges related to the remedial action schedule.

528 Table 48 shows all attributes of GridStateIntensity.

529

**Table 48 – Attributes of ExtRemedialAction::GridStateIntensity**

name	mult	type	description
parameterType	0..1	NullCIM	(CSA) Parameter type for IrregularTimePoint.value1.
valueKind	0..1	<a href="#">ValueOffsetKind</a>	(CSA) The kind of the IrregularTimePoint.value1.

530

531 Table 49 shows all association ends of GridStateIntensity with other classes.

532 **Table 49 – Association ends of ExtRemedialAction::GridStateIntensity with other**  
533 **classes**

mult from	name	mult to	type	description
0..*	GridStateAlteration	1..1	<a href="#">GridStateAlteration</a>	(CSA) The grid state alteration which has intensity.
0..*	IrregularIntervalSchedule	1..1	IrregularIntervalSchedule	(CSA) The irregular interval schedule that is associated with an intensity.

534

535 **2.3.27 (CSA) RemedialActionScheduleAcceptance root class**

536 It identifies if the remedial action schedule is accepted for a given system operator.

537 Table 50 shows all attributes of RemedialActionScheduleAcceptance.

538

**Table 50 – Attributes of ExtRemedialAction::RemedialActionScheduleAcceptance**

name	mult	type	description
kind	0..1	<a href="#">AcceptanceKind</a>	(CSA) The kind of the remedial action acceptance.

539

540 Table 51 shows all association ends of RemedialActionScheduleAcceptance with other classes.

541 **Table 51 – Association ends of**  
542 **ExtRemedialAction::RemedialActionScheduleAcceptance with other classes**

mult from	name	mult to	type	description
0..*	RemedialActionSchedule	0..1	<a href="#">RemedialActionSchedule</a>	(CSA) A remedial action schedule for which a remedial action schedule acceptance is reported.
0..*	SystemOperator	0..1	<a href="#">SystemOperator</a>	(CSA) A system operator for which a remedial action schedule acceptances are reported.

543

544 **2.3.28 (CSA) AcceptanceKind enumeration**

545 The kind of acceptance for a remedial action schedule.

546 Table 52 shows all literals of AcceptanceKind.

547

**Table 52 – Literals of ExtRemedialAction::AcceptanceKind**

literal	value	description
accepted		The acceptance of remedial action schedule is concluded and accepted.
refused		The acceptance of the remedial action schedule is concluded and refused.
waiting		The acceptance of the remedial action schedule is waiting (in progress).
timeout		The acceptance of the remedial action schedule was not completed due to timeout.

548

**549 2.3.29 (CSA) QualitativeRemedialActionThreshold root class**

550 It provides the qualitative threshold for a remedial action. It is only applicable to quantifiable  
551 grid state alterations such as tap alteration, redispatch, target value alteration, but not status  
552 related alterations.

553 All grid alterations linked to the remedial action have to be of the same type.

554 Table 53 shows all attributes of QualitativeRemedialActionThreshold.

**555 Table 53 – Attributes of ExtRemedialAction::QualitativeRemedialActionThreshold**

name	mult	type	description
value	0..1	Float	(CSA) The value is the threshold about which the System Operator is potentially impacted.
kind	0..1	<a href="#">ImpactAgreementKind</a>	(CSA) The impact agreement kind.

556

557 Table 54 shows all association ends of QualitativeRemedialActionThreshold with other classes.

**558 Table 54 – Association ends of  
559 ExtRemedialAction::QualitativeRemedialActionThreshold with other classes**

mult from	name	mult to	type	description
0..*	RemedialAction	1..1	<a href="#">RemedialAction</a>	(CSA) The remedial action that has a qualitative threshold.
0..*	ImpactedSystemOperator	1..1	<a href="#">SystemOperator</a>	(CSA) The impacted System Operator that assigns a qualitative threshold.

560

**561 2.3.30 (CSA) ImpactAgreementKind enumeration**

562 The impact agreement for the remedial action threshold.

563 Table 55 shows all literals of ImpactAgreementKind.

**564 Table 55 – Literals of ExtRemedialAction::ImpactAgreementKind**

literal	value	description
noAgreement		An agreement is no reached on the qualitative impact of a remedial action.
threshold		An agreement that the remedial action is impacting when the remedial action intensity is above a given threshold. Therefore, QualitativeRemedialActionThreshold.value is required.
never		An agreement is reached that a remedial action is never impacting.

literal	value	description
always		An agreement is reached that the remedial action is always impacting whichever the intensity.

565

566 **2.3.31 (CSA) RemedialActionKind enumeration**

567 The different kinds for a remedial action.

568 Table 56 shows all literals of RemedialActionKind.

569

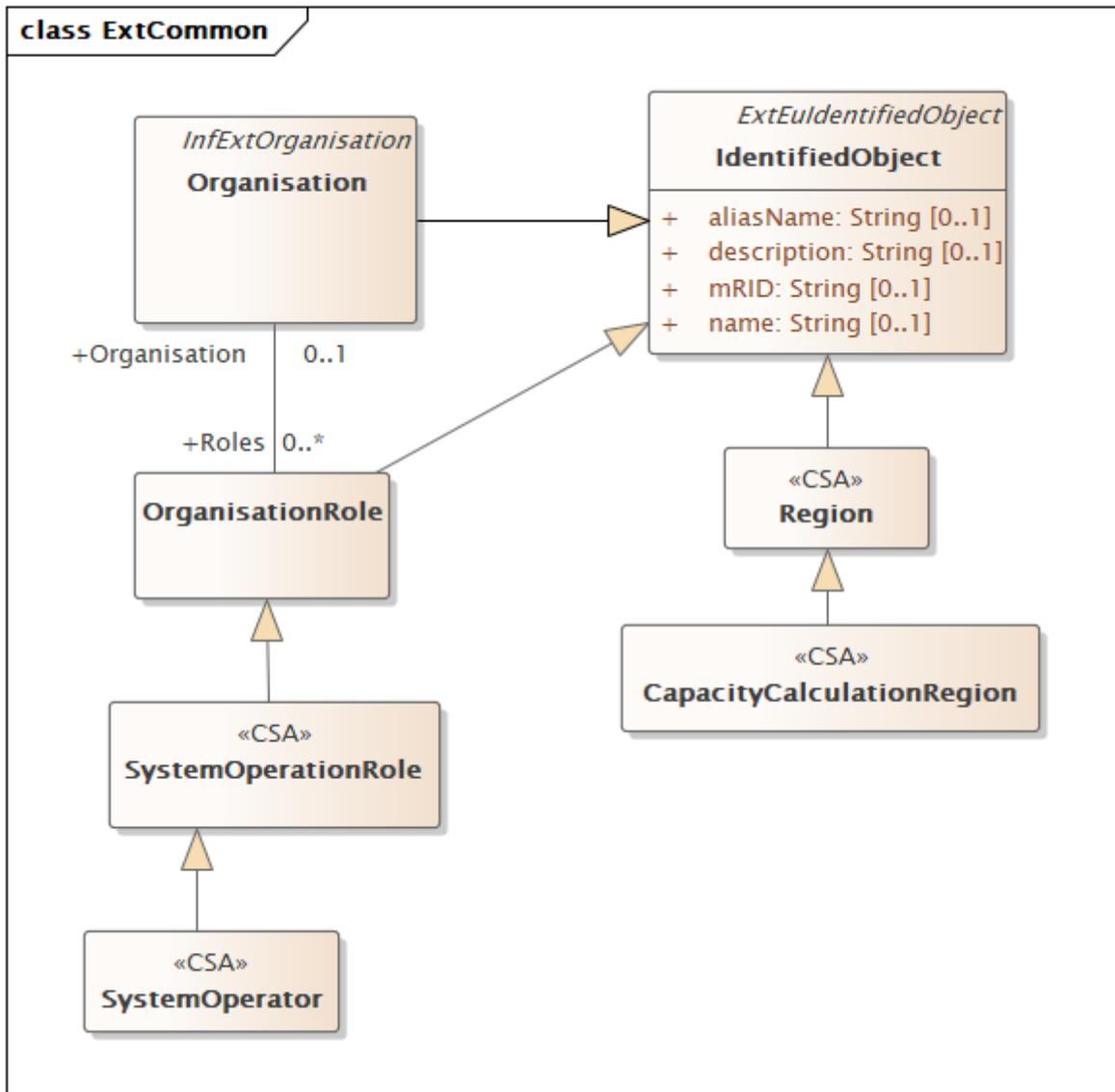
**Table 56 – Literals of ExtRemedialAction::RemedialActionKind**

literal	value	description
curative		It indicates if the remedial action is curative.
preventive		It indicates if the remedial action is preventive.
curativeAndPreventive		It indicates if the remedial action is curative and preventive.

570

571 **2.4 Package ExtCommon**572 **2.4.1 General**

573 The package contains common extensions.



574

575

**Figure 5 – Class diagram ExtCommon::ExtCommon**

576 Figure 5: The diagram shows extensions related to the organisation and organisation role. Note  
577 that this work will be finalised outside the CSA data exchange projects.

578 **2.4.2 (CSA) SystemOperator**

579 Inheritance path = [SystemOperationRole](#) : OrganisationRole : IdentifiedObject :  
580 ExtEulIdentifiedObject  
581 System operator.

582 Table 57 shows all attributes of SystemOperator.

583

**Table 57 – Attributes of ExtCommon::SystemOperator**

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

name	mult	type	description
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

584

585

Table 58 shows all association ends of SystemOperator with other classes.

586

**Table 58 – Association ends of ExtCommon::SystemOperator with other classes**

mult from	name	mult to	type	description
0..*	RemedialActionSchedule	0..*	<a href="#">RemedialActionSchedule</a>	(CSA) Remedial action schedule that impacts system operator.
0..1	RemedialAction	0..*	<a href="#">RemedialAction</a>	(CSA) Remedial action defined by this system operator.
1..1	OutcomeValue	0..*	<a href="#">OutcomeValue</a>	(CSA) Impact assessment outcome value for this system operator.
0..1	OwnedContingency	0..*	Contingency	(CSA) Contingency owned by this system operator.
0..1	RemedialActionScheduleAcceptance	0..*	<a href="#">RemedialActionScheduleAcceptance</a>	(CSA) Remedial action schedule acceptance related to a system operator.
1..1	QualitativeRemedialActionThreshold	0..*	<a href="#">QualitativeRemedialActionThreshold</a>	(CSA) The qualitative threshold for a given System Operator.
0..*	CrossBorderAssessedElement	0..*	<a href="#">AssessedElement</a>	(CSA) All cross-border relevant network elements on which operational security violations need to be managed in a coordinated way.
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: OrganisationRole
0..*	Organisation	0..1	Organisation	inherited from: OrganisationRole
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

587

588

### 2.4.3 (CSA) Region

589

Inheritance path = IdentifiedObject : ExtEulIdentifiedObject

590

A region where the system operator belongs to.

591

Table 59 shows all attributes of Region.

592

**Table 59 – Attributes of ExtCommon::Region**

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

593

594

Table 60 shows all association ends of Region with other classes.

595

**Table 60 – Association ends of ExtCommon::Region with other classes**

mult from	name	mult to	type	description
0..1	RemedialActionSchedule	0..*	<a href="#">RemedialActionSchedule</a>	(CSA) The remedial action schedule relevant for this region.
0..*	RemedialAction	0..*	<a href="#">RemedialAction</a>	The remedial action which is considered in the region.
0..*	Contingency	0..*	Contingency	(CSA) The contingency which is studied by the region.
0..1	LimitViolation	0..*	<a href="#">LimitViolation</a>	(CSA) The limit violation reported by a region.
0..*	AssessedElement	0..*	<a href="#">AssessedElement</a>	(CSA) These are the assessed elements for a region.
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

596

**597 2.4.4 (CSA) CapacityCalculationRegion**598 Inheritance path = [Region](#) : IdentifiedObject : ExtEulIdentifiedObject

599 This is the capacity calculation region for which regional security analysis is performed.

600 Table 61 shows all attributes of CapacityCalculationRegion.

601

**Table 61 – Attributes of ExtCommon::CapacityCalculationRegion**

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

602

603 Table 62 shows all association ends of CapacityCalculationRegion with other classes.

**604 Table 62 – Association ends of ExtCommon::CapacityCalculationRegion with other classes**

605

mult from	name	mult to	type	description
0..1	RemedialActionSchedule	0..*	<a href="#">RemedialActionSchedule</a>	(CSA) inherited from: <a href="#">Region</a>
0..*	RemedialAction	0..*	<a href="#">RemedialAction</a>	inherited from: <a href="#">Region</a>
0..*	Contingency	0..*	Contingency	(CSA) inherited from: <a href="#">Region</a>
0..1	LimitViolation	0..*	<a href="#">LimitViolation</a>	(CSA) inherited from: <a href="#">Region</a>
0..*	AssessedElement	0..*	<a href="#">AssessedElement</a>	(CSA) inherited from: <a href="#">Region</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

606

**607 2.4.5 (CSA) SystemOperationRole**

608 Inheritance path = OrganisationRole : IdentifiedObject : ExtEulIdentifiedObject

609 A system operator role.  
610 Table 63 shows all attributes of SystemOperationRole.

611 **Table 63 – Attributes of ExtCommon::SystemOperationRole**

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEuIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEuIdentifiedObject

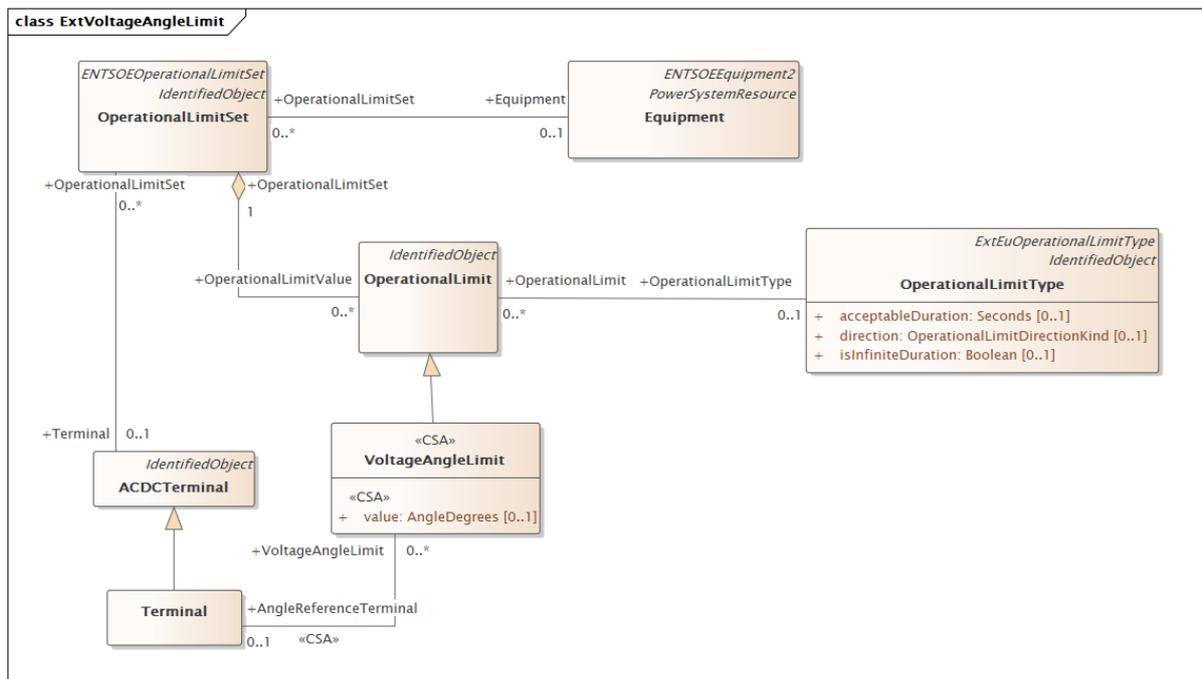
612  
613 Table 64 shows all association ends of SystemOperationRole with other classes.

614 **Table 64 – Association ends of ExtCommon::SystemOperationRole with other classes**

mult from	name	mult to	type	description
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: OrganisationRole
0..*	Organisation	0..1	Organisation	inherited from: OrganisationRole
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

615  
616 **2.5 Package ExtVoltageAngleLimit**  
617 **2.5.1 General**

618



619  
620 **Figure 6 – Class diagram ExtVoltageAngleLimit::ExtVoltageAngleLimit**

621 Figure 6:

## 622 2.5.2 (CSA) VoltageAngleLimit

623 Inheritance path = OperationalLimit : IdentifiedObject : ExtEulIdentifiedObject

624 The voltage angle limit for a two terminal ConductingEquipment. The association  
625 OperationalLimitSet.Terminal shall be instantiated for Terminal with sequenceNumber equal to  
626 1.

627 Table 65 shows all attributes of VoltageAngleLimit.

628 **Table 65 – Attributes of ExtVoltageAngleLimit::VoltageAngleLimit**

name	mult	type	description
value	0..1	AngleDegrees	(CSA) The difference in angle degrees between Terminal with sequenceNumber equal to 1 and the Terminal referenced by the association VoltageAngleLimit.AngleReferenceTerminal. The value can be positive, negative or zero depending on the angle difference between the two terminals.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

629

630 Table 66 shows all association ends of VoltageAngleLimit with other classes.

631 **Table 66 – Association ends of ExtVoltageAngleLimit::VoltageAngleLimit with other**  
632 **classes**

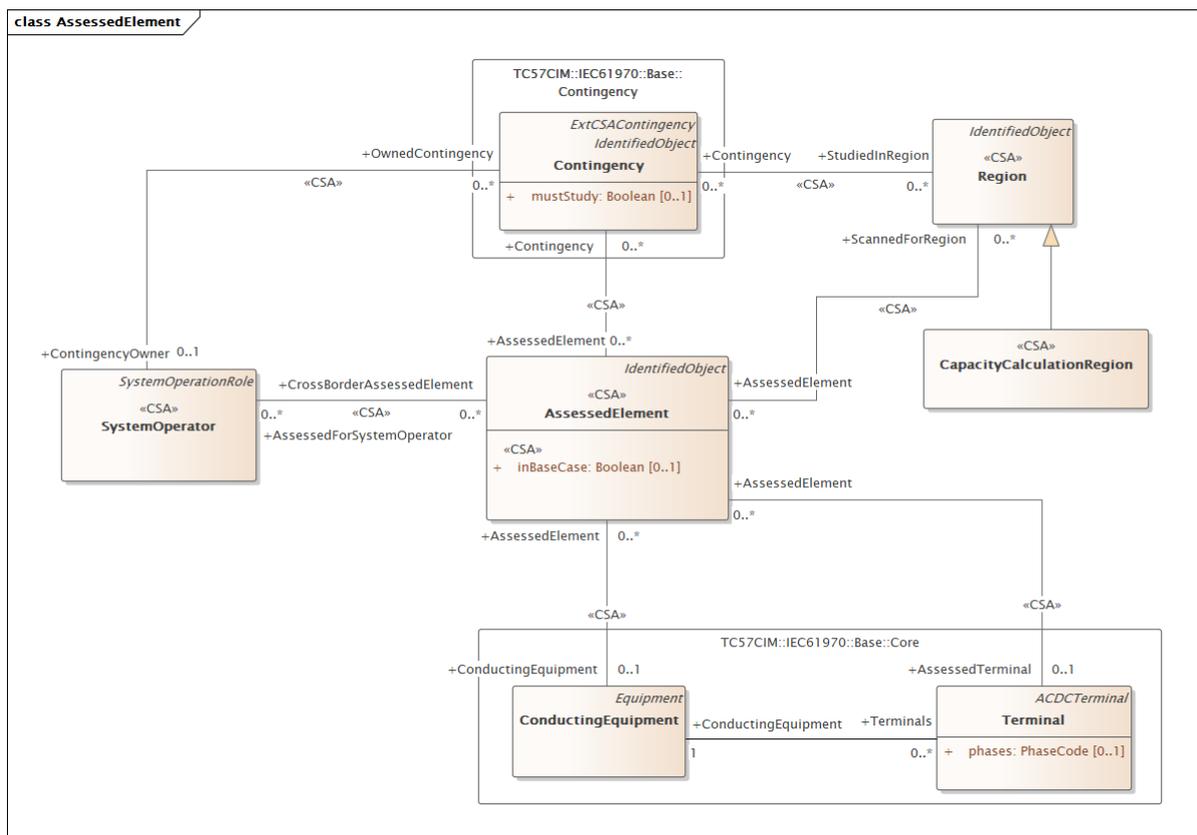
mult from	name	mult to	type	description
0..*	AngleReferenceTerminal	0..1	Terminal	(CSA) The angele reference terminal for the voltage angel limit.
0..*	OperationalLimitSet	1..1	OperationalLimitSet	inherited from: OperationalLimit
0..*	OperationalLimitType	0..1	OperationalLimitType	inherited from: OperationalLimit
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

633

## 634 2.6 Assessed element extensions

### 635 2.6.1 General

636 This package contains the extensions related to the assessed element.



637

638

**Figure 7 – Class diagram ExtAssessedElement::AssessedElement**

639 Figure 7: The diagram contains classes related to assessed element.

640 **2.6.2 (CSA) AssessedElement**

641 Inheritance path = IdentifiedObject : ExtEulIdentifiedObject

642 Assessed element is a network element for which the electrical state is evaluated in the regional  
643 or cross-regional process and which value is expected to fulfil regional rules function of the  
644 operational security limits.

645 The information of the validity period of the assessed element is derived from the conducting  
646 equipment.

647 The measurements and limits are as defined in the steady state hypothesis.

648 Table 67 shows all attributes of AssessedElement.

649

**Table 67 – Attributes of ExtAssessedElement::AssessedElement**

name	mult	type	description
inBaseCase	0..1	Boolean	(CSA) Indicates if the assessed element is scanned in the base case. True means that the assessed element is scanned in the base case. False means it is not scanned in the base case. In case of false the association AssessedElement.Contingency is required.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject

name	mult	type	description
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

650  
651  
652  
653

Table 68 shows all association ends of AssessedElement with other classes.

**Table 68 – Association ends of ExtAssessedElement::AssessedElement with other classes**

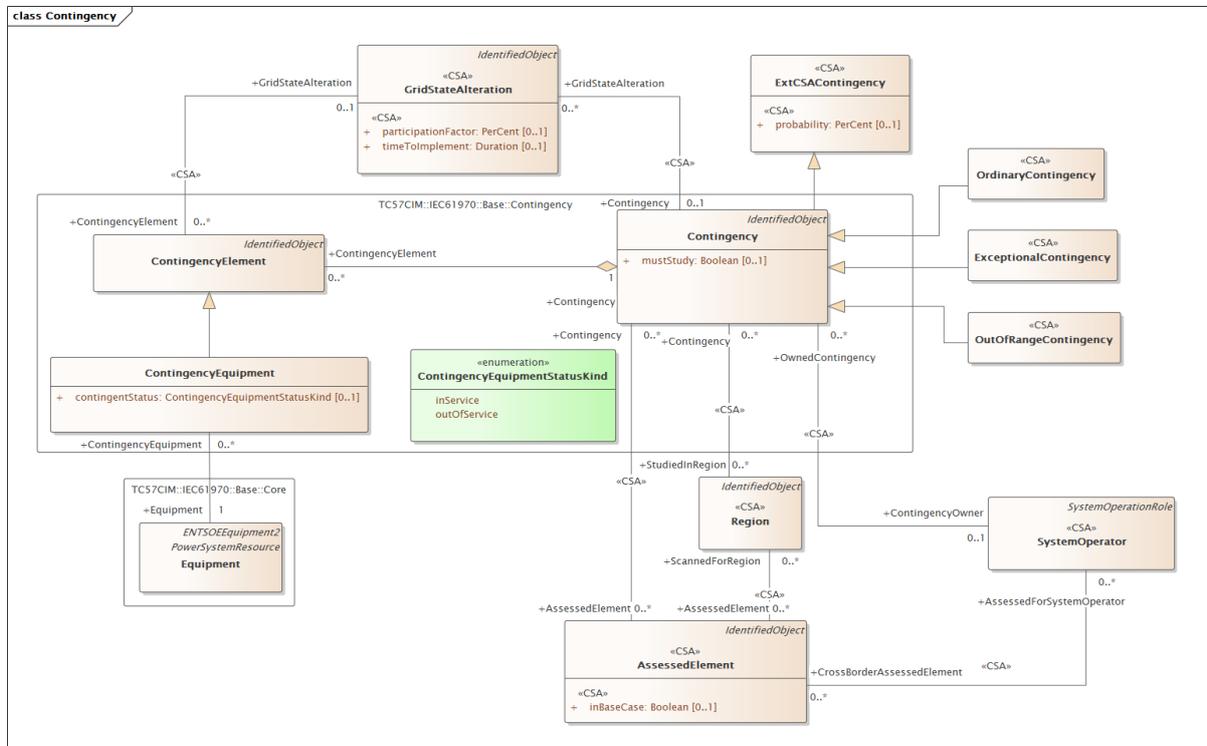
mult from	name	mult to	type	description
0..*	AssessedForSystemOperator	0..*	<a href="#">SystemOperator</a>	(CSA) All system operators for which this cross border assessed element is assessed.
0..*	ScannedForRegion	0..*	<a href="#">Region</a>	(CSA) This is the region in which this assessed element is scanned.
0..*	Contingency	0..*	Contingency	(CSA) The contingency to be simulated for an this assessed element.
0..*	ConductingEquipment	0..1	ConductingEquipment	(CSA) The conducting equipment that is designated as an assessed element, i.e. the equipment that is assessed.
0..*	AssessedTerminal	0..1	Terminal	(CSA) The terminal that is assessed.
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

654  
655  
656  
657

## 2.7 Contingency extensions

### 2.7.1 General

This package contains the extensions related to the contingency.



658  
659

**Figure 8 – Class diagram ExtContingency::Contingency**

660 Figure 8: The diagram contains classes related to the contingency.

### 661 2.7.2 (CSA) ExceptionalContingency

662 Inheritance path = Contingency : IdentifiedObject : ExtEulIdentifiedObject : [ExtCSAContingency](#)  
663 Exceptional contingency means the simultaneous occurrence of multiple contingencies with a  
664 common cause.

665 Table 69 shows all attributes of ExceptionalContingency.

666 **Table 69 – Attributes of ExtContingency::ExceptionalContingency**

name	mult	type	description
mustStudy	0..1	Boolean	inherited from: Contingency
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject
probability	0..1	PerCent	(CSA) inherited from: <a href="#">ExtCSAContingency</a>

667

668 Table 70 shows all association ends of ExceptionalContingency with other classes.

669 **Table 70 – Association ends of ExtContingency::ExceptionalContingency with other**  
670 **classes**

mult from	name	mult to	type	description
1..1	ContingencyElement	0..*	ContingencyElement	inherited from: Contingency
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

671

### 672 2.7.3 (CSA) ExtCSAContingency root class

673 Contains attributes that extend the Contingency class by assigning an owner and probability of  
674 occurrence.

675 Table 71 shows all attributes of ExtCSAContingency.

676 **Table 71 – Attributes of ExtContingency::ExtCSAContingency**

name	mult	type	description
probability	0..1	PerCent	(CSA) Probability of occurrence.

677

### 678 2.7.4 (CSA) OrdinaryContingency

679 Inheritance path = Contingency : IdentifiedObject : ExtEulIdentifiedObject : [ExtCSAContingency](#)

680 Ordinary contingency means the occurrence of a contingency of a single branch or injection.

681 Table 72 shows all attributes of OrdinaryContingency.

682 **Table 72 – Attributes of ExtContingency::OrdinaryContingency**

name	mult	type	description
mustStudy	0..1	Boolean	inherited from: Contingency
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject

name	mult	type	description
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject
probability	0..1	PerCent	(CSA) inherited from: <a href="#">ExtCSAContingency</a>

683

684 Table 73 shows all association ends of OrdinaryContingency with other classes.

685 **Table 73 – Association ends of ExtContingency::OrdinaryContingency with other**  
686 **classes**

mult from	name	mult to	type	description
1..1	ContingencyElement	0..*	ContingencyElement	inherited from: Contingency
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

687

688 **2.7.5 (CSA) OutOfRangeContingency**689 Inheritance path = Contingency : IdentifiedObject : ExtEulIdentifiedObject : [ExtCSAContingency](#)690 Out of range means the simultaneous occurrence of multiple contingencies without a common  
691 cause, or a loss of power generating modules with a total loss of generation capacity exceeding  
692 the reference incident.

693 Table 74 shows all attributes of OutOfRangeContingency.

694 **Table 74 – Attributes of ExtContingency::OutOfRangeContingency**

name	mult	type	description
mustStudy	0..1	Boolean	inherited from: Contingency
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject
probability	0..1	PerCent	(CSA) inherited from: <a href="#">ExtCSAContingency</a>

695

696 Table 75 shows all association ends of OutOfRangeContingency with other classes.

697 **Table 75 – Association ends of ExtContingency::OutOfRangeContingency with other**  
698 **classes**

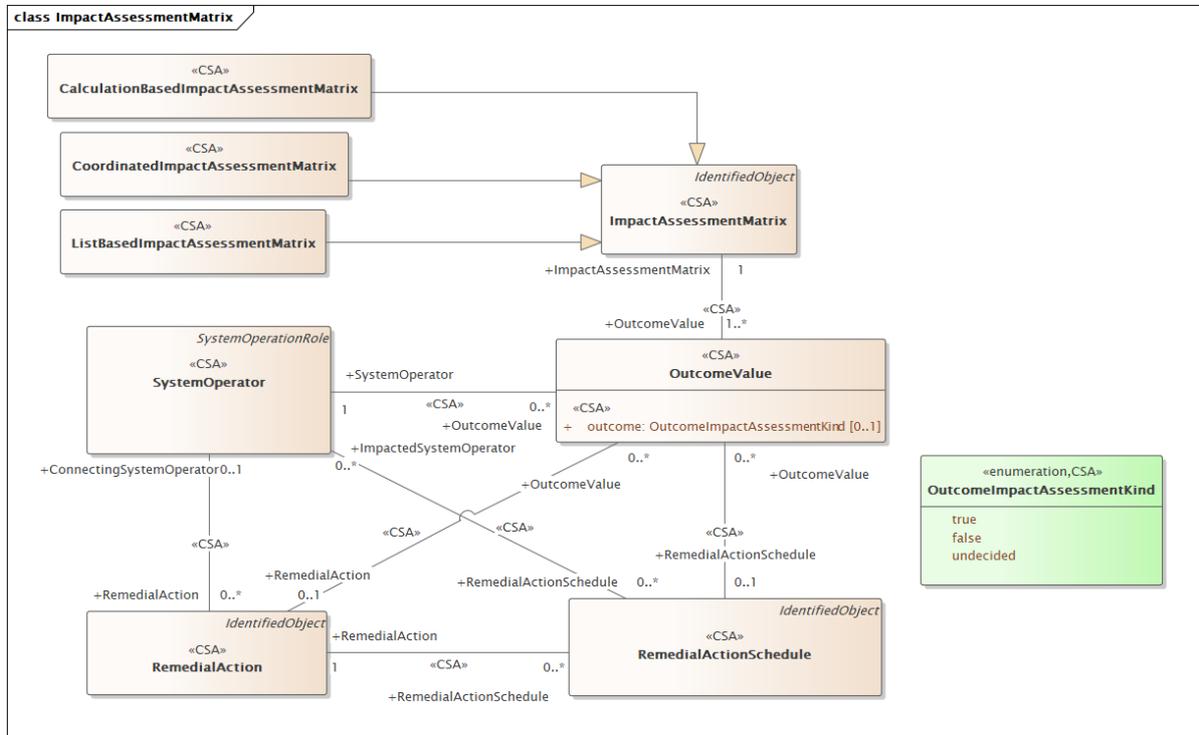
mult from	name	mult to	type	description
1..1	ContingencyElement	0..*	ContingencyElement	inherited from: Contingency
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

699

700 **2.8 Impact assessment matrix extensions**

701 **2.8.1 General**

702 This package contains the extensions related to the impact assessment matrix.



703  
704 **Figure 9 – Class diagram ExtImpactAssessmentMatrix::ImpactAssessmentMatrix**

705 Figure 9: The diagram contains the classes related to the modelling of the impact assessment  
706 matrix.

707 **2.8.2 (CSA) CalculationBasedImpactAssessmentMatrix**

708 Inheritance path = [ImpactAssessmentMatrix](#) : IdentifiedObject : ExtEulIdentifiedObject  
709 Calculation based impact assessment matrix. It relates to the remedial action schedule.  
710 Table 76 shows all attributes of CalculationBasedImpactAssessmentMatrix.

711 **Table 76 – Attributes of**  
712 **ExtImpactAssessmentMatrix::CalculationBasedImpactAssessmentMatrix**

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

713  
714 Table 77 shows all association ends of CalculationBasedImpactAssessmentMatrix with other  
715 classes.

716  
717  
718**Table 77 – Association ends of  
ExtImpactAssessmentMatrix::CalculationBasedImpactAssessmentMatrix with other  
classes**

mult from	name	mult to	type	description
1..1	OutcomeValue	1..*	<a href="#">OutcomeValue</a>	(CSA) inherited from: <a href="#">ImpactAssessmentMatrix</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

719

**2.8.3 (CSA) ImpactAssessmentMatrix**

721 Inheritance path = IdentifiedObject : ExtEulIdentifiedObject

722 It is the result of an impact assessment analysis for each remedial action or remedial action  
723 schedule onto the grid and operation of each system operator.

724 Table 78 shows all attributes of ImpactAssessmentMatrix.

725

**Table 78 – Attributes of ExtImpactAssessmentMatrix::ImpactAssessmentMatrix**

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

726

727 Table 79 shows all association ends of ImpactAssessmentMatrix with other classes.

**Table 79 – Association ends of ExtImpactAssessmentMatrix::ImpactAssessmentMatrix  
with other classes**

728

729

mult from	name	mult to	type	description
1..1	OutcomeValue	1..*	<a href="#">OutcomeValue</a>	(CSA) One of the values of the impact assessment matrix.
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

730

**2.8.4 (CSA) CoordinatedImpactAssessmentMatrix**732 Inheritance path = [ImpactAssessmentMatrix](#) : IdentifiedObject : ExtEulIdentifiedObject

733 Coordinated impact assessment matrix.

734 Table 80 shows all attributes of CoordinatedImpactAssessmentMatrix.

735

736

**Table 80 – Attributes of  
ExtImpactAssessmentMatrix::CoordinatedImpactAssessmentMatrix**

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject

name	mult	type	description
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

737  
738 Table 81 shows all association ends of CoordinatedImpactAssessmentMatrix with other  
739 classes.

740 **Table 81 – Association ends of**  
741 **ExtImpactAssessmentMatrix::CoordinatedImpactAssessmentMatrix with other classes**

mult from	name	mult to	type	description
1..1	OutcomeValue	1..*	<a href="#">OutcomeValue</a>	(CSA) inherited from: <a href="#">ImpactAssessmentMatrix</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

742

### 743 2.8.5 (CSA) ListBasedImpactAssessmentMatrix

744 Inheritance path = [ImpactAssessmentMatrix](#) : IdentifiedObject : ExtEulIdentifiedObject

745 List based impact assessment matrix. It refers to the remedial action.

746 Table 82 shows all attributes of ListBasedImpactAssessmentMatrix.

747 **Table 82 – Attributes of**  
748 **ExtImpactAssessmentMatrix::ListBasedImpactAssessmentMatrix**

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

749

750 Table 83 shows all association ends of ListBasedImpactAssessmentMatrix with other classes.

751 **Table 83 – Association ends of**  
752 **ExtImpactAssessmentMatrix::ListBasedImpactAssessmentMatrix with other classes**

mult from	name	mult to	type	description
1..1	OutcomeValue	1..*	<a href="#">OutcomeValue</a>	(CSA) inherited from: <a href="#">ImpactAssessmentMatrix</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

753

### 754 2.8.6 (CSA) OutcomeValue root class

755 This is the outcome of an impact assessment matrix.

756 Table 84 shows all attributes of OutcomeValue.

757

**Table 84 – Attributes of ExtImpactAssessmentMatrix::OutcomeValue**

name	mult	type	description
outcome	0..1	<a href="#">OutcomeImpactAssessmentKind</a>	(CSA) Outcome value.

758

759

Table 85 shows all association ends of OutcomeValue with other classes.

760

761

**Table 85 – Association ends of ExtImpactAssessmentMatrix::OutcomeValue with other classes**

mult from	name	mult to	type	description
0..*	RemedialActionSchedule	0..1	<a href="#">RemedialActionSchedule</a>	(CSA) The remedial action schedule that has an outcome value.
0..*	RemedialAction	0..1	<a href="#">RemedialAction</a>	(CSA) The remedial action that has an outcome value.
1..*	ImpactAssessmentMatrix	1..1	<a href="#">ImpactAssessmentMatrix</a>	(CSA) the impact assessment matrix which has this value.
0..*	SystemOperator	1..1	<a href="#">SystemOperator</a>	(CSA) The system operator that has an outcome value.

762

763

**2.8.7 (CSA) OutcomeImpactAssessmentKind enumeration**

764

Outcome impact assessments kinds.

765

Table 86 shows all literals of OutcomeImpactAssessmentKind.

766

**Table 86 – Literals of ExtImpactAssessmentMatrix::OutcomeImpactAssessmentKind**

literal	value	description
true		True.
false		False.
undecided		Undecided. Used only for list-based impact assessment matrix.

767

768

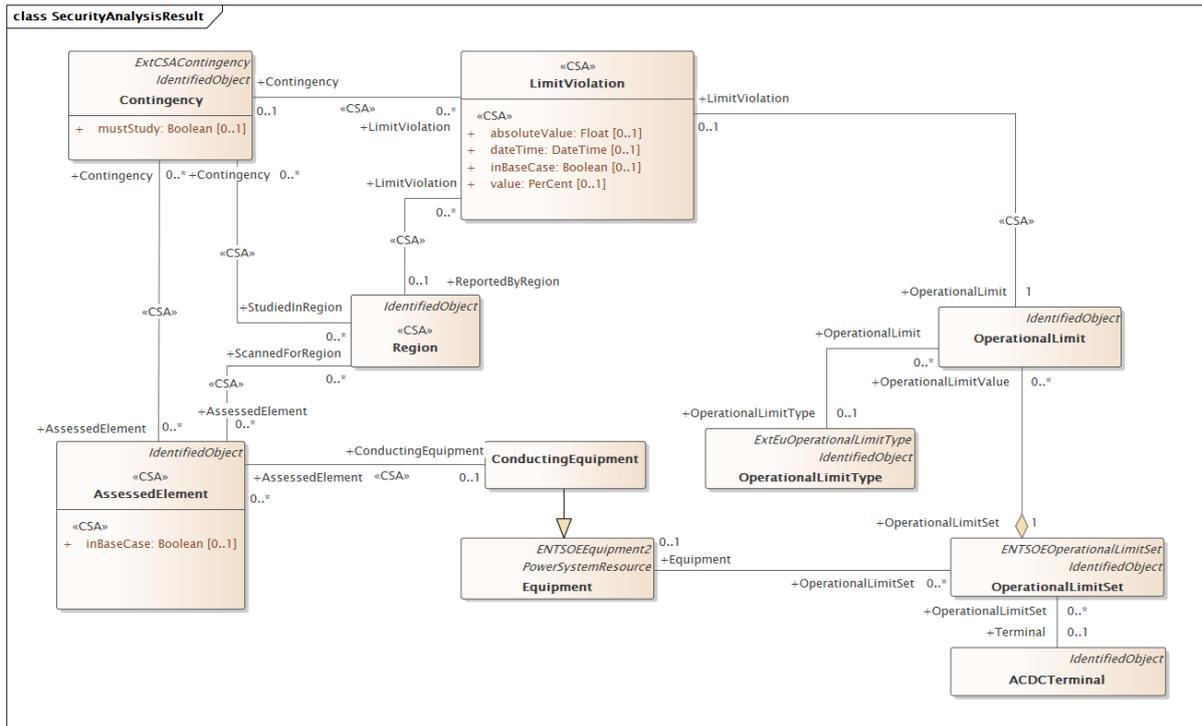
**2.9 Security analysis result extensions**

769

**2.9.1 General**

770

This package contains the extensions related to the security analysis result.



771

**Figure 10 – Class diagram ExtSecurityAnalysisResult::SecurityAnalysisResult**

772

773 Figure 10: The diagram contains classes related to the security analysis result.

774 **2.9.2 (CSA) LimitViolation root class**

775 Limit violation.

776 Table 87 shows all attributes of LimitViolation.

777 **Table 87 – Attributes of ExtSecurityAnalysisResult::LimitViolation**

name	mult	type	description
value	0..1	PerCent	(CSA) The value of the limit violation in percent related to the value of the operational limit that is violated. For instance, if the operational limit is 1000 A and the current flow is 1100 A the value is reported as 110 %.
absoluteValue	0..1	Float	(CSA) It is the absolute value which results from a power flow calculation. For instance, if the operational limit is 1000 A and the current flow is 1100 A the absoluteValue is reported as 1100 A.
dateTime	0..1	DateTime	(CSA) The date and time of the scenario time that was studied and at which the limit violation occurred.
inBaseCase	0..1	Boolean	(CSA) Indicates if the limit violation was detected in the base case. True means that the reported limit violation occurred in the base case. False means it did not occur in the base case. In case of false the association LimitViolation.Contingency is required.

778

779 Table 88 shows all association ends of LimitViolation with other classes.

780 **Table 88 – Association ends of ExtSecurityAnalysisResult::LimitViolation with other**  
781 **classes**

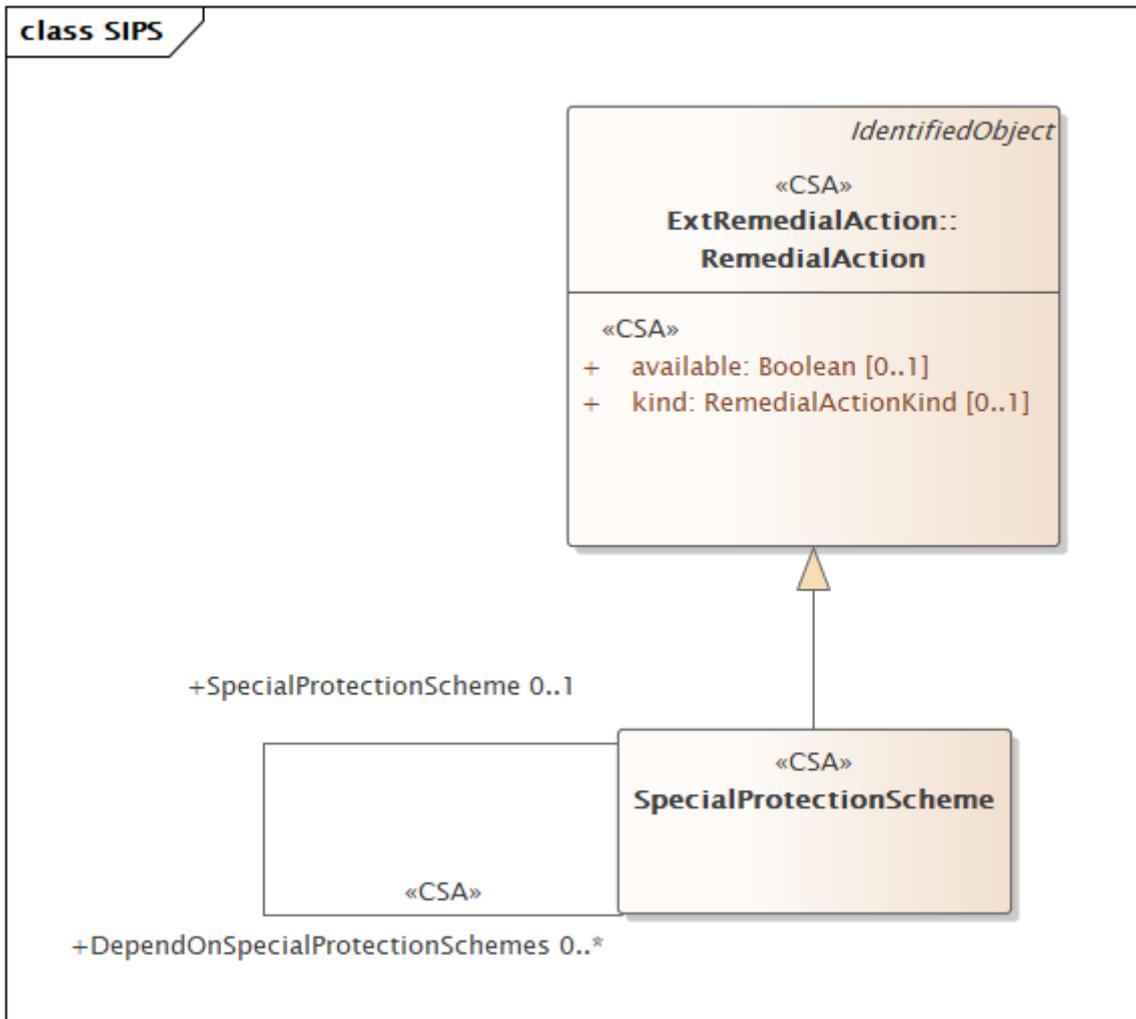
mult from	name	mult to	type	description
0..1	OperationalLimit	1..1	OperationalLimit	(CSA) The operational limit that has a limit violation.
0..*	Contingency	0..1	Contingency	(CSA) The contingency that has a limit violation.
0..*	ReportedByRegion	0..1	<a href="#">Region</a>	(CSA) The region which reports this limit violation.

782

783 **2.10 SIPS extensions**

784 **2.10.1 General**

785 This package contains the extensions related to the SIPS.



786

787 **Figure 11 – Class diagram ExtSIPS::SIPS**

788 Figure 11: The diagram contains classes related to the system integrity protection scheme  
789 (SIPS).

790 **2.10.2 (CSA) SpecialProtectionScheme**791 Inheritance path = [RemedialAction](#) : IdentifiedObject : ExtEulIdentifiedObject

792 Special protection scheme.

793 Table 89 shows all attributes of SpecialProtectionScheme.

794 **Table 89 – Attributes of ExtSIPS::SpecialProtectionScheme**

name	mult	type	description
kind	0..1	<a href="#">RemedialActionKind</a>	(CSA) inherited from: <a href="#">RemedialAction</a>
available	0..1	Boolean	(CSA) inherited from: <a href="#">RemedialAction</a>
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject
energyIdentCodeEic	0..1	String	(European) inherited from: ExtEulIdentifiedObject
shortName	0..1	String	(European) inherited from: ExtEulIdentifiedObject

795

796 Table 90 shows all association ends of SpecialProtectionScheme with other classes.

797 **Table 90 – Association ends of ExtSIPS::SpecialProtectionScheme with other classes**

mult from	name	mult to	type	description
0..1	DependOnSpecialProtectionSchemes	0..*	<a href="#">SpecialProtectionScheme</a>	(CSA) The special protection scheme on which this special protection scheme depends on.
0..*	SpecialProtectionScheme	0..1	<a href="#">SpecialProtectionScheme</a>	(CSA) The special protection scheme with which this special protection scheme is associated with.
0..1	GridStateAlteration	0..*	<a href="#">GridStateAlteration</a>	(CSA) inherited from: <a href="#">RemedialAction</a>
1..1	RemedialActionSchedule	0..*	<a href="#">RemedialActionSchedule</a>	(CSA) inherited from: <a href="#">RemedialAction</a>
0..*	Contingency	0..*	Contingency	(CSA) inherited from: <a href="#">RemedialAction</a>
1..1	RemedialActionCostCharacteristic	0..1	<a href="#">RemedialActionCostCharacteristic</a>	(CSA) inherited from: <a href="#">RemedialAction</a>
0..1	OutcomeValue	0..*	<a href="#">OutcomeValue</a>	(CSA) inherited from: <a href="#">RemedialAction</a>
0..*	ConnectingSystemOperator	0..1	<a href="#">SystemOperator</a>	(CSA) inherited from: <a href="#">RemedialAction</a>
0..*	ConsideredInRegion	0..*	<a href="#">Region</a>	inherited from: <a href="#">RemedialAction</a>
1..1	QualitativeRemedialActionThreshold	0..*	<a href="#">QualitativeRemedialActionThreshold</a>	(CSA) inherited from: <a href="#">RemedialAction</a>
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

798