

# Network Code (NC) profiles

## Release 2.3.2-beta

ICTC approved on 13 February 2025

### Release notes

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- This set of documents and artifacts is the continuation of the work previously known as “Network Code profiles for Coordinated Security Analysis (CSA)” in its version 2.2.
- ENTSO-E updated the profiles and relevant artifacts to consider new use cases and correct identified bugs.
- For release 2.3.0, ENTSO-E corrected the name of the artifacts for better comprehension.
  - Please, refer to the latest version of the Application Profiles Library (version 1.0.1 at the moment of writing) and its documentation for more help on how to use all the machine understandable Common Grid Model Exchange Standard (CGMES) and Network Code (NC) CGMES extensions.
- In release 2.3.1, ENTSO-E adapts the related artifacts and profiles’ specifications of the Network Codes profiles after the standard-vetting interoperability (SV-IOP) test held in July 2024.
  - The following bug fixes were introduced:
    - Add association for OutagePlanningAgent
    - Correcting misspelling: “EquipmenController” by “EquipmentController”
    - Correction HourPeriod having empty description.
    - Updating CrossBorderRelevance in the canonical extension and in SIS profile (related to issue 7.3. isCrossBorderRelevant update of snippet)
    - Correcting SchemeRemedialAction inconsistency in RA profile and canonical extension.
    - Harmonising RA profile after changes related to PTC.
    - Adding dependency between EQ and SSH profiles.
    - Fixing RemedialActionSchedule related to Grouping of RASs
    - Adding mRID creation for PowerSchedule, RedispatchScheduleAction and RemedialActionSchedule in relation to Cost Sharing.
    - Clarification on SSI PowerRemedialAction attributes: making maxRegulatingDown and maxRegulatingUp optional.
    - Fixing missing GridStateAlteration for inService of ACLineSegment class.
    - Fixing StageTrigger missing .armed in SIS profile.
    - Clarifying interpretation of valueA in PowerFlowResult in the SAR.
    - Correcting issue in schema ObjectRegistry-AP-Voc-RDFS2020\_v2-2-0.rdf
    - Linking remedial action schemes to multiple EQ models.
    - Correcting AreaDispatchableUnit missing inheritance (related to IOP issue 7.1. Wrong inheritance to IdentifiedObject)
    - Adding references of ContingencyElement.Contingency type from ContingencyEquipment.
    - Clarifying multiple profile / ConformTo reference and Fixing technical incorrection with schema Header-AP-Voc-RDFS2020\_v2-3-1 (related to issue 7.4. Multiple profile / ConformTo reference).
    - Modifying ExceptionalContingency.kind attribute to be optional in CO profile.
    - Clarification on FACTSEquipment class.
    - Fixing GenericSequenceSchedule.EnergyBlockOrder cardinality to be optional.

- SHACL generator was updated to use alternative path (related to 7.2. Validation issues and References of ContingencyElement.Contingency type from ContingencyEquipment)
- The following two SHACL rules were modified to include Line:
  - C:NC:AE:AssessedElement:associations
    - *An AssessedElement shall have at least one of the following association ends instantiated: AssessedElement.ConductingEquipment, AssessedElement.OperationalLimit, AssessedElement.DCTieCorridor, AssessedElement.AssessedPowerTransferCorridor.*
  - R:NC:AE: AssessedElement:danglingAssociations
    - *Due to the nature of the exchange and requirements it is allowed that the associations AssessedElement.ConductingEquipment, AssessedElement.OperationalLimit, AssessedElement.DCTieCorridor, AssessedElement.AssessedPowerTransferCorridor provide a dangling reference. This occurs when the referenced element is in another MAS. Validation of these associations is only performed when all dangling references are completed.*
  - C:NC:ER:Circuit:associations
    - *The Circuit shall be associated with either Equipment or Terminal.*
- Specially, the Metadata for Dataset Distribution Specification v2.4 and the Security Analysis Result profile specification 2.4 got a minor updates and not only patch fixes. This was necessary for the proper harmonisation of the ENTSO-E material. (related to issue 7.4. Multiple profile / ConformTo reference, 7.7. Language in the header)
- The release 2.3.2 consists uniquely of bug fixing and adding clarifications where needed. Users are offered a more detailed description of what changed below:
  - Changes magnitude: patch.
    - Backwards compatible bug fixing, clarifications and imperfections correction.
  - Changes nature: specifications, information model (UML) and Application Profiles (RDFS, SHACL) change.
  - Changes' description:
    - **Specifications and information model (UML)**
      - In the Canonical Extensions
        - Solved bug in the association PowerBidSchedule.ScheduleResource.
        - Fixing RangeConstraint.normalValue and value sign convention.
        - Correcting incorrect unit on CapacityTimePoint.
        - Correcting nc:FrequencyControlFuntion.targetValue is misspelled.
        - Correcting terms without rdfs:comment.
        - Fixing DCConductingEquipment ratedCurrent stereotype missing.
        - Updating Property Reference in the Energy Reference Data because of stereotype changes.
      - SIS profile
        - Solving bug in the association PowerBidSchedule.ScheduleResource.
        - Fixing missing "multiplier isFixed" in NC.
        - Correcting terms without rdfs:comment.

- RA profile
  - Correcting RangeConstraint.normalValue and value sign convention.
  - Fixing mechanism to validate Property reference.
  - Removing "Line" class from RA profile.
- SSI profile
  - Correcting RangeConstraint.normalValue and value sign convention.
  - Correcting nc:FrequencyControlFuntion.targetValue is misspelled.
  - Correcting missing "multiplier isFixed" in NC.
  - Updating Property Reference in the Energy Reference Data (because of stereotype changes).
- RAS profile
  - Solving bug in the association PowerBidSchedule.ScheduleResource.
  - Solving bug in constraint - C:NC:RAS:RemedialActionScheduleDependency:associations.
- ER profile
  - Correcting nc:FrequencyControlFuntion.targetValue is misspelled.
  - Correcting missing "multiplier isFixed" in NC.
  - Fixing DCCconductingEquipment ratedCurrent stereotype missing.
  - Fixing mechanism to validate Property reference.
- GD profile
  - Correcting missing "multiplier isFixed" in NC.
- SHS profile
  - Correcting terms without rdfs:comment.
- Header
  - Correcting Header issue related to keyword: The cardinality of the dcat:keyword is 0..1 and it should be 0..n.
- Reference data
  - PropertyReference data is generated due to match the update ofProperty Reference in the Energy Reference Data.
- **In the Application Profiles (RDFS and SHACL)**
  - Updating RemedialActionSchedule-AP-Con-Complex-SHACL\_v2-3-2.ttl due to constraint bug - C:NC:RAS:RemedialActionScheduleDependency:associations.
  - Updating StateInstructionSchedule-AP-Con-Complex-SHACL\_v2-3-2.ttl due bug in the association PowerBidSchedule.ScheduleResource.
  - Updating EquipmentReliability-AP-Con-Complex-SHACL\_v2-3-2.ttl due to Mechanism to validate Property reference.
  - Updating RemedialAction-AP-Con-Complex-SHACL\_v2-3-1.ttl due to Mechanism to validate Property reference.
  - All RDFS (all profiles) got a new number as - dcterms namespace was changed to refer to W3C one; updated version info and modified date.
  - All Complex SHACL were changes to fix namespace of dcterms and versionInfo.

- Simple SHACL for the 2 versions of the header only manually changed to fix the dterms and versionInfo. For dataset header also keyword cardinality was manually fixed.
- All the rest of simple SHACL was regenerated to fix profile changes, dterms namespace, versionInfo, usage of sh:class instead of sh:in for associations value in case the target is only one class and not multiple.