

CESOP VM - User Manual (UMN)

TIS Central Electronic System Of Payment

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1 Document control information

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The document author and any reviewers are authorized to make the following types of changes to the document and related JIRA issues without requiring that the artifact be re-approved:

- Editorial, formatting, and spelling;
- Clarifications.

To request a change to this document, contact the document author or project owner.

Changes to this document are summarized in the table in reverse chronological order (the latest version first).

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Key	Summary						
CESOP-1888	Trigger 99999 in case same reported payee is reported at least twice in the same message						
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Version	Date	Description	Sections						
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Key	Summary								
CESOP-916	Remove Business Rule PS-BR-0010 (error code 30010)								
2.10	14 Mar 2024	Implementation of the following RfC(s), in the scope of CESOP v1.5.0: <table><tr><th>Key</th><th>Summary</th></tr><tr><td>CESOP-1028</td><td>CESOP VM: Update the validation API</td></tr><tr><td>CESOP-1743</td><td>Update links in VM UMN</td></tr></table> 2 issues Version Submitted for Review (SfR) in the scope of the RfA SC10-491.	Key	Summary	CESOP-1028	CESOP VM: Update the validation API	CESOP-1743	Update links in VM UMN	7.2.2, 7.2.3, 8.1
Key	Summary								
CESOP-1028	CESOP VM: Update the validation API								
CESOP-1743	Update links in VM UMN								
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1.30	29 Aug 2023	Changelog added, highlighting the changes between 1.2 and 1.3 Elaborate on shaded and regular jars. Provide more examples of API usage through the implementation of the following RfC: <table><tr><th>Key</th><th>Summary</th></tr><tr><td>CESOP-1099</td><td>CESOP-VM - remove internal identifiers from public API</td></tr></table> 1 issue Version Submitted for Review (SfR) in the scope of the RfA SC08-279	Key	Summary	CESOP-1099	CESOP-VM - remove internal identifiers from public API	8, 9, 10		
Key	Summary								
CESOP-1099	CESOP-VM - remove internal identifiers from public API								
1.20	23 May 2023	Implementation of the following RfC:	5.1,7,8						

Version	Date	Description	Sections				
		<table><tr><th>Key</th><th>Summary</th></tr><tr><td>CESOP-898</td><td>Update VM UMN following comments of v1.10</td></tr></table> 1 issue Version Submitted for Information (SfI) in the scope of SC07-415	Key	Summary	CESOP-898	Update VM UMN following comments of v1.10	
Key	Summary						
CESOP-898	Update VM UMN following comments of v1.10						
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4 Introduction

4.1 Document purpose

The purpose of this document is to provide a user manual to the intended audience that explains how to operate the CESOP Validation Module using the command-line or programmatic interface.

Since access to Jira and Nexus is restricted, please check the DG TAXUD file-sharing system [CIRCABC](#) or the EU Website for the required resources.

4.2 Target audience

The target audience for this document includes:

- DG TAXUD, in particular, B4 as System Supplier and C4 as System Owner;
- The Payment Service Providers (PSPs);
- The Member State TAX Administrations (MSs);
- The Quality Assurance (QA5);
- The DG TAXUD contractors.

4.3 Scope

This document describes how the CESOP Validation Module is working, which rules are covered by which supported XSD version and provides detailed instructions on the use cases that validate the CESOP payment messages.

4.4 Reference documents

The table below lists the documents that are referred to in the current document.

Reference	Title	Originator	Version	Date
R01	CESOP – XSD User Guide	SOFT-DEV	4.80	12 Feb 2024

4.5 Applicable documents

The table below lists the documents to which the current document must be compliant.

Reference	Title	Originator	Version	Date
A01	SOFT-DEV Framework Contract	TAXUD/2021/CC/162	N/A	24 Jun 2021
A02	Specific Contract n°08	TAXUD/2022/DE/140	N/A	04 Jul 2022

4.6 Abbreviations and acronyms

For a better understanding of the present document, the following table provides a list of the principal abbreviations and acronyms used.

See also the 'list of acronyms' on TEMPO.

Abbreviation/Acronym	Definition
API	Application Programming Interface
CESOP	Central Electronic System Of Payments
CLI	Command Line Interface
IPM	Installation Procedure Manual
JAR	Java Archive
Javadoc	API documentation in HTML format from Java source code
JVM	Java Virtual Machine
MS	Member State
N/A	Not Applicable
NA	National Administration
PMT	Paiement Data (as Message Type)
VLD	Validation Result (as Message Type)
XML	eXtensible Markup Language
XSD	XML Schema Definition
OS	Operating System
RHEL	Red Hat Enterprise Linux
SPI	Java Service Provider Interface

4.7 Definitions

See the 'glossary' on [TEMPO](#) and the definitions from the XSD User Guide [[R01](#)].

5 General Information

5.1 System Overview

The CESOP Validation Module v1.5.0 provides two interfaces:

1. The Command Line Interface (CLI) (see [Command Line Interface](#)) provides access to the functionalities from the command line.
2. The Application Programming Interface (API) (see [Programmatic Interface](#)) provides programmatic access to the functionalities.

In both cases, the CESOP Validation Module has:

- as **input**: the CESOP XML file to be validated. This file must be a Payment data message (with “PMT” as MessageType);
- as **output**: the resulting ValidationResult, which is a CESOP XML file with “VLD” as MessageType.

For details on the Validation Result structure, please refer to the XSD User Guide [\[R01\]](#).

The CESOP validation module v1.5.0 is compatible with versions **4.00, 4.01 and 4.02 of the XSD**. The implementation works as follows:

- If a file is sent for validation with a supported version, the VM will always validate this file according to that version (e.g. if a file from v4.00 is sent for validation, the validation result will be generated based on the v4.00 of the XSD);
- If a file is sent for validation where the version of the XSD is not defined or is defined but not supported, the file will be considered invalid and will thus be fully rejected (with a related error message stating that the submitted file is not compliant with the supported versions of the XSD, and listing those supported versions);
- If the file header cannot be parsed, the response will be rendered for the default (latest) version which may not be the same as in the request.

5.2 Hardware requirements

The CESOP Validation Module requires this minimum hardware setup :

Processor	Running any Java-compatible instruction set, docked at 1 GHz
RAM	256 MB
Free hard disk space	90 MB

5.3 System requirements

The target system must meet the following requirements to execute the CESOP Validation Module:

Java	Version 8 or higher
Operating System (OS)	Any OS able to run Java SE ¹

5.4 Authorized Use Permission

No restriction on the application usage.

5.5 User Support

In case of issue, the ITSM Service Desk must be contacted via Support@itsmtaxud.europa.eu.

6 Command Line Interface

6.1 Installation of the application

Download the VM jar file (please consult [appendix 9.1](#)) and check the parameters (specified in [chapter 7.3](#)) that can be used for its execution.

6.2 CLI usage

The CESOP Validation Module is available as a Java jar file that can be executed using a JVM.

The command to validate a CESOP XML file using the standard console output has the following syntax:

```
java -jar cesop-vm-application-1.5.0.jar <path-to-message>
```

where

- <path-to-message> is the path to the CESOP XML file to validate.

Only XML output is written to standard output(stdout). If any execution error occurs, it's written to standard error(stderr) and the program exists with non-0 code. The command to validate a CESOP XML file using an output file has the following syntax:

```
java -jar cesop-vm-application-1.5.0.jar input.xml > output.xml
```

For more details on the CESOP XML file structure, please refer to the XSD User Guide [\[R01\]](#).

6.3 Configuration of the application

The CESOP Validation Module uses the following parameters:

Parameter name	Description	Format	Default value
psp.xsd.max.size	indicates the maximum file size allowed as input (in bytes)	int	1073741824
business.min.period	indicates the CESOP starting period (to allow testing in the future)	date (YYYYQ)	20211*
business.max.errors	indicates the maximum number of errors allowed in the ValidationResult output (to avoid too big output file)	int	5000

Example:

```
java -Dbusiness.min.period=20241 -Dbusiness.max.errors=10 -jar cesop-vm-application-1.5.0.jar input.xml
```

* Please keep in mind that the Go-live date for CESOP is 01.01.2024. For now, the default value is configured to be earlier just for testing purposes. The `business.min.period` setting can freely

be updated as long as it refers to a past or ongoing period, otherwise, the VM will reject everything.

7 Programmatic Interface

7.1 Installation of the library

Add a dependency on cesop-validation to your project. It is available as a regular jar and a shaded jar.

```
<dependencies>
  <dependency>
    <groupId>eu.europa.ec.taxud.cesop</groupId>
    <artifactId>cesop-validation</artifactId>
    <version>1.5.0</version>
    <classifier>shaded</classifier>
  </dependency>
</dependencies>
```

7.1.1 Shaded jar

With `shaded` classifier, this jar encapsulates 3rd-party dependencies, meaning it's an all-in-one archive.

It also does not include META-INF/services folder from woodstox-core, effectively disabling the Java SPI for that module. This is helpful when the library is used in projects with other XML libraries that also provide their implementations via SPI.

This is the recommended variant of the library because it is easier and safer to use.

7.1.2 Regular jar

This is a regular maven-built thin jar. It has transitive dependencies on stax2-api and woodstox-core. Since this jar is distributed as a regular file and not via maven repository, you may need to add the transitive dependencies explicitly:

```
<dependencies>
  <dependency>
    <groupId>org.codehaus.woodstox</groupId>
    <artifactId>stax2-api</artifactId>
    <version>4.2.1</version>
  </dependency>
  <dependency>
    <groupId>com.fasterxml.woodstox</groupId>
    <artifactId>woodstox-core</artifactId>
    <version>6.5.0</version>
  </dependency>
</dependencies>
```

This variant may be used instead of the shaded jar when the project already depends on stax2-api and woodstox. In this case, using the shaded jar will add a lot of duplicate classes into the final project distributive.

7.2 API usage

CESOP VM Javadoc is included into CESOP FSR DOC archive (please consult [appendix 9.1](#)). It contains the documentation for the public and protected API of the Validation Module. It does not include private or package-private API documentation.

7.2.1 Basic file validation

The entry point for the programmatic access is the `PspFileValidator` class, managing the validation of the message and the generation of the `ValidationResult`.

```
import eu.europa.ec.taxud.cesop.validation.PspFileValidator;
import eu.europa.ec.taxud.cesop.validation.PspValidationResult;

PspValidationResult result = PspFileValidator.createDefault().validate(new
File("/test.xml"));
System.out.printf("File validated with %s errors%n",
result.getErrors().size());
```

7.2.2 Evaluate validation result

Evaluate the overall type of validation result - valid, full or partial rejection.

```
import eu.europa.ec.taxud.cesop.domain.ValidationResultTypeEnum;
import eu.europa.ec.taxud.cesop.validation.PspValidationResult;

PspValidationResult result = PspFileValidator.createDefault().validate(new
File("/test.xml"));
ValidationResultTypeEnum validationType = result.getResultType();
```

7.2.3 Render XML reply

Render an XML string with VLD reply message. The same as produced by CLI or CESOP core.

```
import java.io.ByteArrayOutputStream;
import eu.europa.ec.taxud.cesop.validation.PspValidationResult;
import eu.europa.ec.taxud.cesop.writers.ValidationMessageXmlWriter;

PspValidationResult result = PspFileValidator.createDefault().validate(new
File("/test.xml"));
String resultXML = result.getResultXml();
```

7.2.4 Configuration

In order to override the default settings (See [Configuration of the application](#)), the validator can be created via constructor. Normally, it should be used with default settings, but overriding them may be helpful in testing.

```
int transactionsPerPart = 10;
int minBusinessPeriod = 20211;
int maxInputBytes = 1024 * 1024;
int maxErrors = 50;
ValidationSettings settings = new ValidationSettings(minBusinessPeriod,
maxInputBytes, maxErrors);
PspFileValidator validator = new PspFileValidator(transactionsPerPart,
settings);
```


8 Appendix

8.1 Links

8.1.1 Nexus

[CESOP FSR folder on Nexus](#) contains three FSR archives per release:

- SRC with source code for CESOP VM API;
- DOC with javadoc for CESOP VM API;
- BIN with jar files for CESOP VM CLI and API.

Starting with CESOP v1.4.0, a dedicated VM package is also available and it contains all VM-related artifacts.

8.1.2 EU CESOP page

The latest version of the CESOP VM is publicly available at the following link:

https://taxation-customs.ec.europa.eu/taxation-1/central-electronic-system-payment-information-cesop_en

-
1. Note that the CESOP Validation Module has been tested only on Windows and RHEL OS ____

9 Mapping business rules & XSD version (CESOP v1.5.0)

9.1 Mapping between XSD, XSD User Guide and CESOP release versions

The following table shows how the XML schema versions are correlated with the XSD User Guide and CESOP release versions (see also the below section [List of RfCs impacting the XSD \(User Guide\) per CESOP release](#)):

XML schema version	XSD User Guide version	CESOP release version
4.02	4.80	1.5.0
4.02	4.61	1.3.0, 1.4.0
4.02	4.60	
4.02	4.40	
4.01	4.20	
4.00	4.00	
		1.2.0

Note that:

- The above mapping only considers the final document versions delivered in the scope of a release (i.e. intermediate versions, including versions sent for review, are not listed);
- It might happen that a CESOP release does not foresee a change in the XML schema nor in the XSD User Guide. In this latter scenario, the XSD and XSD user guide versions mapped with the previous CESOP release version listed are to be considered.

9.2 Mapping between rules and XSD version

The below table specifies the business rules that are (or were) triggered by the CESOP VM. Note that:

- "Covered by VM" allows to know whether the rule is checked by the CESOP Validation Module or not (i.e. if the rule is stateless or stateful);
- If filled with "x", it means that the rule will breach for the related XSD version(s);
- If filled with "-", it means that the rule is removed for the related XSD version(s);
- This table only applies to version 1.5.0 of CESOP and thus to the v1.5.0 validation module.

9.2.1 Business rules

<ul style="list-style-type: none"> CESOP v1.5.0 VM v1.5.0 			XSD version			
Business rule ID	Error code	Covered by VM	v4.00	v4.01	v4.02	Comment
MH-BR-0010	10010	✗	x	x	x	
MH-BR-0020	10020	✓	x	x	x	
MH-BR-0030	10030	✓	x	x	x	
MH-BR-0040	10040	✗	x	x	x	
MH-BR-0050	10050	✓	x	x	x	
MH-BR-0060	10060	✓	x	x	x	
MH-BR-0070	10070	✓	x	x	x	
MH-BR-0080	10080	✓	x	x	x	
MH-BR-0090	10090	✓	x	x	x	Updated in release v1.3.0 & for all XSD versions: CESOP-818 - COMPLETED
MH-BR-0100	10100	✗	x	x	x	
MH-BR-0110	10110	✓	x	x	x	
MH-BR-0120	10120	✗	x	x	x	Added in release v1.3.0 & for all XSD versions (triggering error code 99999 with v4.00): CESOP-567 - COMPLETED
CM-BR-0010	20010	✓	x	x	x	
CM-BR-0020	20020	✗	x	x	x	
CM-BR-0030	20030	✓	x	x	x	
CM-BR-0040	20040	✗	x	x	x	
CM-BR-0050	20050	✓	x	x	x	
CM-BR-0060	20060	✓	x	x	x	
CM-BR-0070	20070	✗	x	x	x	
CM-BR-0100	20100	✓	x	x	x	
CM-BR-0110	20110	✓	x	x	x	
PS-BR-0010 ¹	30010	-	-	-	-	Removed in release v1.5.0 & for all XSD versions: CESOP-916 - APPROVED
RP-BR-0010	40010	✓	x	x	x	

• CESOP v1.5.0			XSD version			
• VM v1.5.0						
RP-BR-0020	40020	✓	x	x	x	
RP-BR-0030	40030	✓	x	x	x	
RP-BR-0040	40040	✓	x	x	x	
RP-BR-0050	40050	✓	x	x	x	
RP-BR-0060	40060	✓	x	x	x	
RP-BR-0070	40070	✓	x	x	x	
RP-BR-0080	40080	✓	x	x	x	
RT-BR-0010	45010	✓	x	x	x	
RT-BR-0020	45020	-	-	-	-	Removed in release v1.3.0 & for all XSD versions (obsolete rule): ↗ CESOP-930 - COMPLETED
RT-BR-0030 ↗	45030	✓	x	x	x	Updated in release v1.5.0 & for all XSD versions: ↗ CESOP-970 - APPROVED
RT-BR-0040	45040	✓	x	x	x	
RT-BR-0050	45050	✗	x	x	x	
RT-BR-0060	45060	✓	x	x	x	
RT-BR-0080	45080	✓	x	x	x	

9.2.2 Technical rules









• CESOP v1.5.0			XSD version			
• VM v1.5.0						
Technical rule ID	Error code	Covered by VM	v4.00	v4.01	v4.02	Comment
CM-TR-0010	50010	✓	x	x	x	
CM-TR-0020	50020	✗	x	x	x	
CM-TR-0030	50030	✗	x	x	x	
CM-TR-0040	50040	✗	x	x	x	
CM-TR-0050	50050	✗	x	x	x	
CM-TR-0060	50060	✗	x	x	x	
CM-TR-0070	50070	✓	x	x	x	

• CESOP v1.5.0			XSD version			
• VM v1.5.0						
CM-TR-0080	50080	✓	x	x	x	
CM-TR-9000	99999	✓	x	x	x	Covers the following case(s): <ul style="list-style-type: none"> When a message includes at least two same payees reported under different ReportedPayee elements - Added in release v1.4.5 & for all XSD versions: ↗ CESOP-1888 - FAT COMPLETED

9.3 List of RfCs impacting the XSD (User Guide) per CESOP release

9.3.1 CESOP v1.3.0

Key	Summary	T	Component/s	Labels
CESOP-567	Validate if transmitting country equals the partner id country	↗	FSR, TDS, XSD, XSD User Guide	XSD_UserGuide_v4.20 XSD_v4.01
CESOP-568	Validate if transmitting country equals the country of the uploader	↗	FSR, TDS, XSD, XSD User Guide	XSD_UserGuide_v4.20 XSD_v4.01
CESOP-811	Migration of CFSS into XSD User Guide	↗	XSD User Guide	XSD_UserGuide_v4.20
CESOP-818	XSD - Update MH-BR-0090 to reject VLD messages (in both VM and CESOP app)	↗	FSR, TDS, VM-FSR, VM-TDS, XSD, XSD User Guide	AMD XSD-Addendum XSD_UserGuide_v4.40 XSD_v4.02
CESOP-819	CESOP - TransactionIdentifier Uniqueness in the System	↗	XSD, XSD User Guide	XSD-Addendum XSD_UserGuide_v4.40 XSD_v4.02
CESOP-821	XSD (User Guide) - Update of representative definitions	↗	XSD, XSD User Guide	XSD-Addendum XSD_UserGuide_v4.40 XSD_v4.02
CESOP-863	XSD User Guide - Update footnote related to files compression	↗	XSD User Guide	XSD-Addendum XSD_UserGuide_v4.40
CESOP-864	XSD - Update regex of TAXIdentification_Type	↗	XSD, XSD User Guide	XSD-Addendum XSD_UserGuide_v4.40 XSD_v4.02
CESOP-870	XSD User guide - Removal of DAC2 references	↗	XSD User Guide	XSD-Addendum XSD_UserGuide_v4.40

Key	Summary	T	Component/s	Labels
CESOP-878	XSD - Update of the Timestamp validation regex		XSD, XSD User Guide	XSD-Addendum XSD_UserGuide_v4.40 XSD_v4.02
CESOP-903	XSD material update the comment for StringMin1Max40 Type		XSD	XSD_UserGuide_v4.20 XSD_v4.01
CESOP-918	Clarification RP-BR-0040 in XSD user guide		XSD User Guide	XSD-Addendum XSD_UserGuide_v4.40
CESOP-930	Remove obsolete business rule RT-BR-0020 (error code 45020)		XSD, XSD User Guide	XSD-Addendum XSD_UserGuide_v4.40 XSD_v4.02
CESOP-967	Partial Rejection of a Spontaneous Correction Data Message		XSD User Guide	AMD XSD-Addendum XSD_UserGuide_v4.40
CESOP-1032	[XSD User Guide] Correlation between two Payment Data messages		XSD User Guide	XSD_UserGuide_v4.60
CESOP-1113	XSD - Update regex of TAXIdentification_Type to consider minus "-"		XSD, XSD User Guide	XSD_UserGuide_v4.60 XSD_v4.02
CESOP-1194	CESOP XSD User Guide - Clarification regarding message where all payees are erroneous		XSD User Guide	XSD_UserGuide_v4.60



[17 issues](#)




9.3.2 CESOP v1.4.0

Key	Summary	T	Component/s	Labels
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[No issues found](#)

9.3.3 CESOP v1.5.0

Key	Summary	T	Component/s	Labels
CESOP-916	Remove Business Rule PS-BR-0010 (error code 30010)		FSR, TDS, VM-FSR, VM-TDS, VM-UMN, XSD User Guide	XSD_UserGuide_v5.00
CESOP-970	Modify BR RT-BR-0030 to have at least one date in reporting period and to take into account the settlement date		FSR, VM-FSR, VM-TDS, VM-UMN, XSD User Guide	XSD_UserGuide_v5.00

Key	Summary	T	Component/s	Labels
CESOP-1493	Adding clarifications for the correlation mechanism in the XSD User Guide		TS, XSD User Guide	XSD_UserGuide_v4.80
CESOP-1715	Handle "1" as "true" for xs:boolean fields		FSR, TDS, VM-FSR, XSD, XSD User Guide	XSD_UserGuide_v4.80 XSD_v4.02
CESOP-1782	CESOP non EU PSP BIC - Update the XSD User Guide to propose using the 'Other'		XSD User Guide	XSD_UserGuide_v4.80

[5 issues](#)

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1. Note that this rule has been removed from CESOP v1.5.0 on, even if the XSD User Guide v4.80 (associated with CESOP v1.5.0) includes this rule. ____
 2. Note that this rule has been updated from CESOP v1.5.0 on, even if it was updated in the XSD User Guide v5.00 (associated with CESOP v1.6.0). ____

10 VM - Scenarios

10.1 Abbreviations used

Abbreviation	Definition
VM	Validation Module
CESOP	Central Electronic System of Payment Information
PSP	Payment Service Provider
XML	Extensible Markup Language
XSD	XML Schema Definition
N.B.	Nota Bene

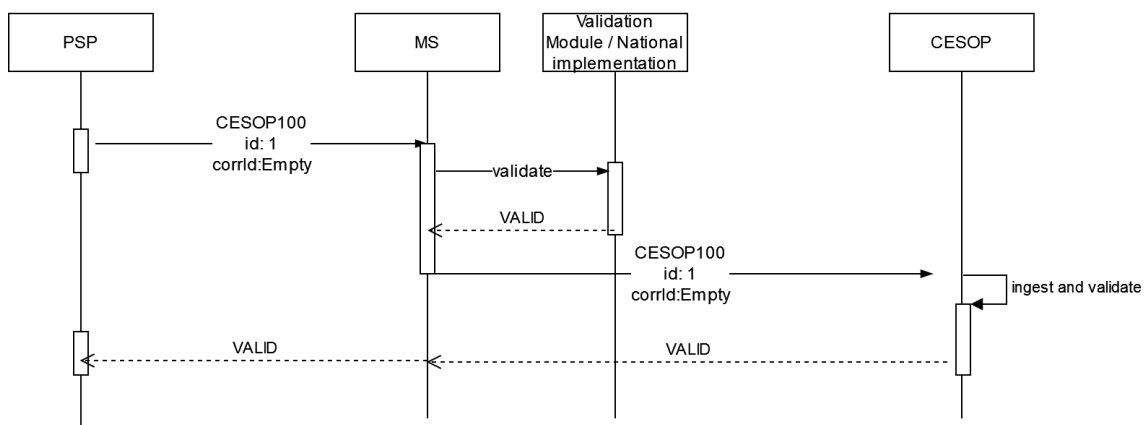
10.2 General Information

- The use of the VM is optional;
- VM validates only the stateless business rules;
- The PARTIAL_REJECTION response is introduced with the v1.2.0 of the VM.

10.3 Scenarios that describe how the VM should be used and how it should NOT be used.

10.3.1 Valid scenario

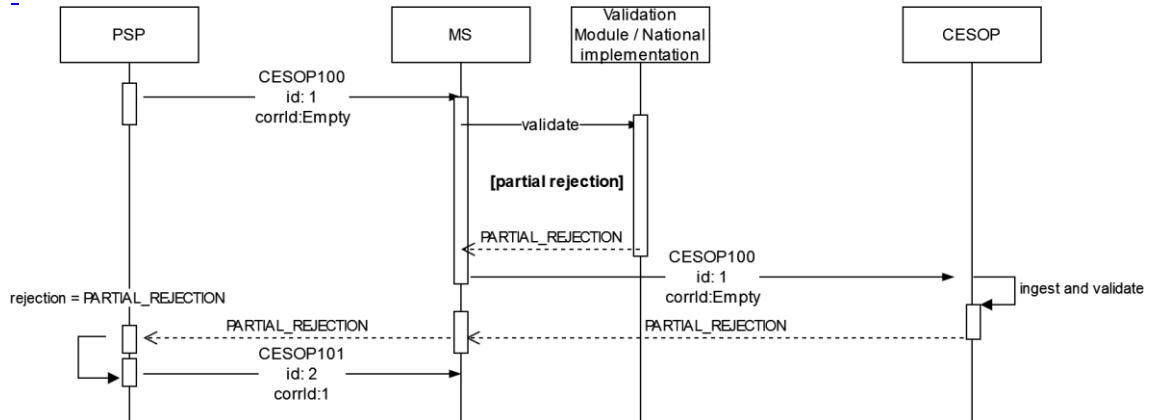
10.3.1.1 Description: The VM and CESOP confirm the XML sent by the PSP is valid and the response it is sent back to the PSP by CESOP via the MS



10.3.2 Partial Rejection scenario

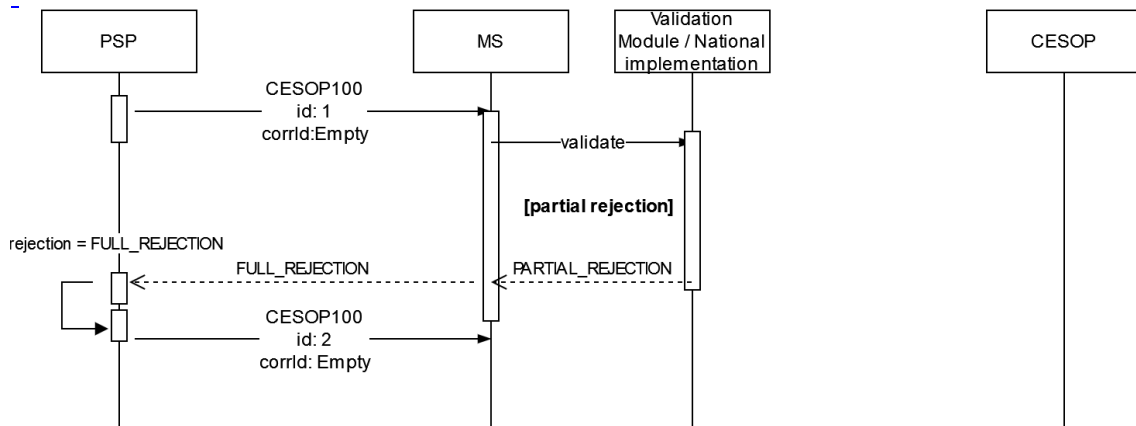
10.3.2.1 Forward partial rejection

10.3.2.1.1 Description: The PSP sends an XML file that is partially rejected at MS level (either by the VM or by a national implementation based on the XSD User Guide). The MS chooses to continue the process and sends the XML file to CESOP. The MS must wait the validation result from CESOP and only after inform the PSP. More details on the scenario 3.6



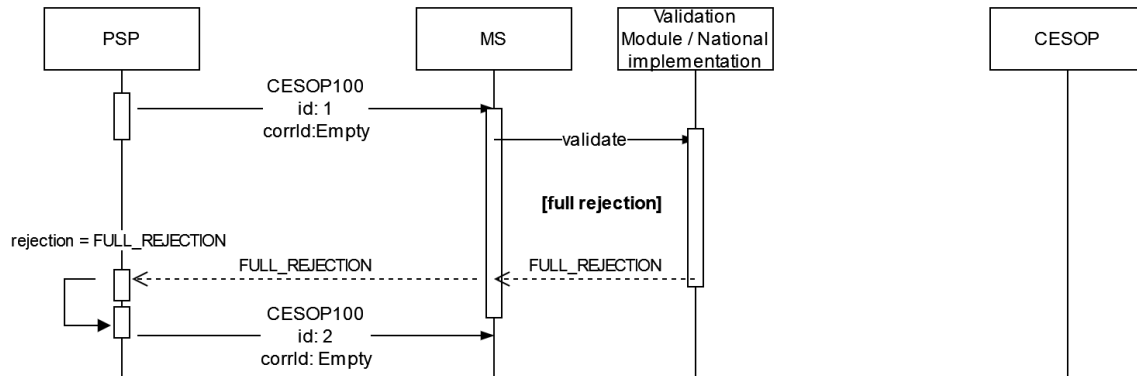
10.3.2.2 Downgrade partial rejection to full rejection

10.3.2.2.1 Description: The PSP sends an XML file that is partially rejected at MS level (either by the VM or by a national implementation based on the XSD User Guide). The MS chooses to stop the process and inform the PSP on the validation result. In this case, the MS has to downgrade the response for PSP to FULL REJECTION.



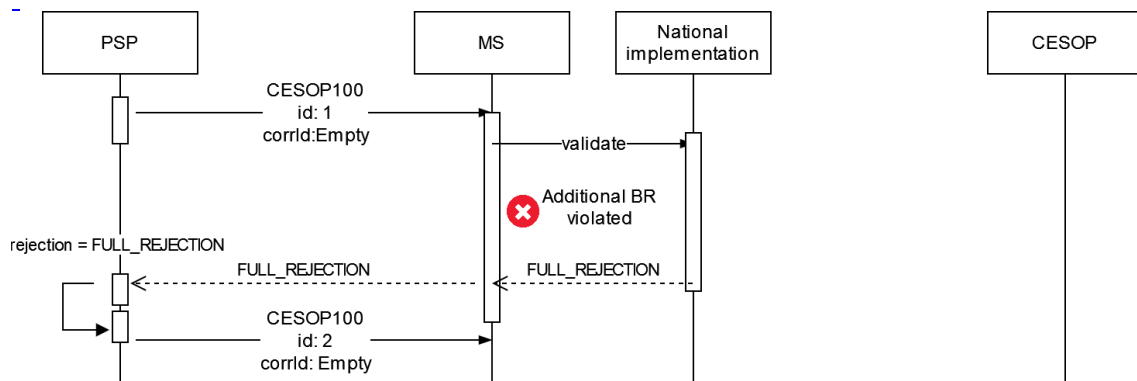
10.3.3 Full Rejection scenario

10.3.3.1 Description: The PSP sends an XML file that is fully rejected at the MS level. In this case, the recommended option for the MS is to send the XML file back to PSP in order to save network bandwidth



10.3.4 National implementation with additional business rules (to the XSD User Guide) scenario

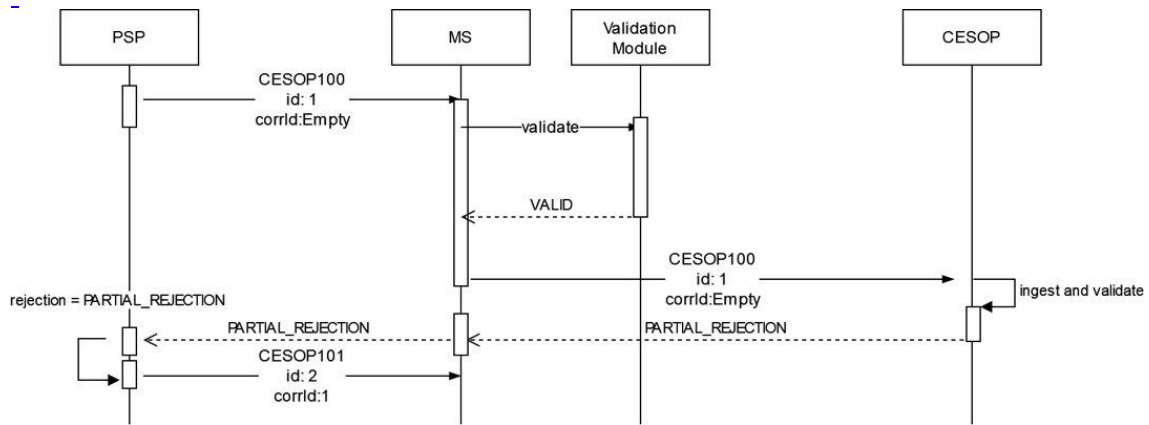
10.3.4.1 Description: When the national implementation contains additional business rules that are not listed in the XSD User Guide and ONLY these rules are violated, then the recommendation is to FULLY REJECT the XML file back to PSP. Otherwise, CESOP could process it as a VALID message.



10.3.5 Valid for VM/Invalid for CESOP

10.3.5.1 Description: Because the VM validates only the stateless rules, an XML file initially considered valid by the VM could be later on PARTIALLY REJECTED by CESOP (CESOP has additional rules).

10.3.5.1.1 N.B. : A stateless rule is a rule that can be checked in isolation, without prior knowledge or reference to past transactions. Each evaluation is made from scratch.



10.3.6 Why MS must NOT partially reject a message directly to the PSP!!

10.3.6.1 Description: In case of partial rejection, ONLY the two scenarios presented in section 3.2 are allowed. Otherwise, when the PSP will send the correction, CESOP will REJECT the message since it does not have record of the initial message. This will create confusion and lack of consistency for the PSPs

