

# Member Access using FIX 4.2 UTP protocol NYSE Euronext Testing Guide

July 2009 – V 2.0

---

**VERSION HISTORY**

<b>Version Number</b>	<b>Date</b>	<b>Source Documents Used</b>	<b>Reasons for issuing a New Version</b>	<b>Sections changed</b>
V 1.0	May 2009			-
V 2.0	July 2009			- Added tests on ClOrdID and Prefixes management

---

**Table of contents**

<b><i>I- SLE CONNECTIVITY</i></b> .....	<b>4</b>
CYCLE C01: Logon MANAGEMENT .....	5
CYCLE C02: RESTART MANAGEMENT .....	11
CYCLE C02: RESTART MANAGEMENT .....	12
CYCLE C04: ADMINISTRATIVE MESSAGES MANAGEMENT .....	28
CYCLE C05: PREFIX AND INSTANCE FOR CLORDID.....	32
<b><i>II- SLE PROFILE</i></b> .....	<b>35</b>
CYCLE P01: TRADING Subscription MANAGEMENT – PRIVATE UNSOLICITED MARKET MESSAGES .....	36
CYCLE P03: TRADING Subscription MANAGEMENT – SOLICITED MARKET MESSAGES.....	38
CYCLE P04: Multi-MARKET SUBSCRIPTION .....	39
CYCLE P05: Multi-Member Subscription (SERVICE BUREAU/ASP only).....	40
<b><i>III- HIGH AVAILABILTY</i></b> .....	<b>41</b>
CYCLE H01: CCG binary FAIL-OVER MANAGEMENT.....	42
<b><i>Annex1- Fail-Over Recovery Data Flow Kinematics</i></b> .....	<b>46</b>

## **I- SLE CONNECTIVITY**

**CYCLE C01: LOGON MANAGEMENT**

**CYCLE C02: RESTART MANAGEMENT**

**CYCLE C03: RETRANSMISSION MANAGEMENT**

**CYCLE C04: ADMINISTRATIVE MESSAGES MANAGEMENT**

**CYCLE C05: PREFIX AND INSTANCE FOR CLORDID**

## CYCLE C01: LOGON MANAGEMENT

### CYCLE OBJECTIVES:

This cycle tests SLE ability to receive and interpret the messages sent when a log-on attempt fails.

### CYCLE PREPARATION:

- Exchange ensures that the SLE is logged off.
- Customer checks their connections and make sure that SLE is not logged on.

### CYCLE DESCRIPTION:

UNIT Number	ACTIONS REQUIRED	UNIT COMPLETION CRITERIA
1. Logon Failure due to invalid sequence number	Customer initiates an SLE logon with a MsgSeqNumber lower than expected	<ul style="list-style-type: none"> <li>• SLE should interpret correctly logon reject. SLE should not keep retrying as long as customer has not corrected the problem.</li> </ul>
2 Logon Failure due to invalid NextExpectedMsgSeqNumber	Customer initiates an SLE logon with a NextExpectedMsgSeqNumber higher than expected	<ul style="list-style-type: none"> <li>• SLE should interpret correctly logon reject. SLE should not keep retrying as long as customer has not corrected the problem</li> </ul>
2. Logon Failure due to invalid SLE Id.	Customer initiates an SLE logon with an invalid SLE Id	<ul style="list-style-type: none"> <li>• SLE should interpret correctly logon reject. SLE should not keep retrying as long as customer has not corrected the problem.</li> </ul>
3. Logon Failure due to port mismatch	Customer initiates an SLE logon using a port of a different SLE. (Applicable only if customer owns several SLE's).	<ul style="list-style-type: none"> <li>• SLE should interpret correctly logon reject. SLE should not keep retrying as long as customer has not corrected the problem.</li> </ul>
4. Logon Failure due to already existing connection.	Customer initiates a second SLE logon after already having established a first place logon with the same SLE ID.	<ul style="list-style-type: none"> <li>• SLE should interpret correctly logon reject. SLE should not keep retrying as long as customer has not corrected the problem.</li> </ul>
5. Logon Failure due to invalid reset sequence management.	Customer initiates an SLE logon without reset the sequence number.	<ul style="list-style-type: none"> <li>• SLE should interpret correctly logon reject. SLE should not keep retrying as long as customer has not corrected the problem.</li> </ul>

**CYCLE DETAILED INSTRUCTIONS:**

**UNIT 1: LOGON FAILURE DUE TO INVALID SEQUENCE NUMBER**

INSTRUCTIONS:

Side	Instructions	Data Key Fields	Data Layout Reference
Exchange	Exchange advises the customer to begin test.		
Customer	Customer initiates a SLE logon with MsgSeqNumber lower than last sent.	SLE ID valid  Tag 34 is lower or same than last message the SLE sent	Logon (A) 34=MsgSeqNumber Logon Reject (j) : field RejCode.

COMPLETION CRITERIA:

- SLE receives and interprets logon reject. SLE should not keep retrying as long as customer has not corrected the problem.

**UNIT 2: LOGON FAILURE DUE TO INVALID NEXTEXPECTEDMSGSEQNUMBER**
**INSTRUCTIONS:**

<b>Side</b>	<b>Instructions</b>	<b>Data Key Fields</b>	<b>Data Layout Reference</b>
Exchange	Exchange advises the customer to begin test.		
Customer	Customer initiates a SLE logon with MsgSeqNumber higher than last received.	SLE ID valid MsgSeqNumber is last message sent + 1 NextExpectedMsgSeqNumber is much higher than last received Sequence Number	Logon (A) 34=MsgSeqNumber 789=NextExpectedMsgSeqNumber Logon Reject (j) : field RejCode.

**COMPLETION CRITERIA:**

- SLE receives and interprets logon reject. SLE should not keep retrying as long as customer has not corrected the problem.

**UNIT 3: LOGON FAILURE DUE TO INVALID SLE ID.**
**INSTRUCTIONS:**

Side	Instructions	Data Key Fields	Data Layout Reference
Exchange	Exchange advises the customer to Begin the test.		
Customer	Customer initiates an SLE log-on with invalid SLE Id.	SLE ID invalid in tag 142 MsgSeqNumber equal to last message sent + 1 NextExpectedMsgSeqNumber equal to last message received + 1	Logon (A) 142=SenderLocationID 34=MsgSeqNumber 789=NextExpectedMsgSeqNumber Logon Reject (j) : field RejCode.

**COMPLETION CRITERIA:**

- SLE receives and interprets logon reject. SLE should not keep retrying as long as customer has not corrected the problem.

**UNIT 4: LOGON FAILURE DUE TO PORT MISMATCH (\*)**
**INSTRUCTIONS:**

(\*) this test is applicable only if customer owns several connections.

Side	Instructions	Data Key Fields	Data Layout Reference
Exchange	Exchange advises the customer to Initiate an SLE log-on.		
Customer	Customer initiates an SLE logon with a port of another SLE that he owns.	SLE ID valid Port invalid	Logon (A) Logon Reject (j) : field RejCode

**COMPLETION CRITERIA:**

- SLE receives and interprets logon reject. SLE should not keep retrying as long as customer has not corrected the problem.

**UNIT 5: LOGON FAILURE DUE TO ALREADY EXISTING CONNECTION**
**INSTRUCTIONS:**

Side	Instructions	Data Key Fields	Data Layout Reference
Exchange	Exchange advises the customer to Initiate an SLE log-on.		
Customer	Customer initiates a first SLE log-on with valid sequence number	SLE ID invalid LastMsgSeqNum equal to last message received	Logon (A)
Customer	Customer initiates a second SLE log-on with valid sequence number	SLE ID invalid LastMsgSeqNum equal to last message received	Logon (A) Logon Reject (j) : field RejCode

**COMPLETION CRITERIA:**

- SLE receive and interpret logon reject. SLE should not keep retrying as long as customer has not corrected the problem.

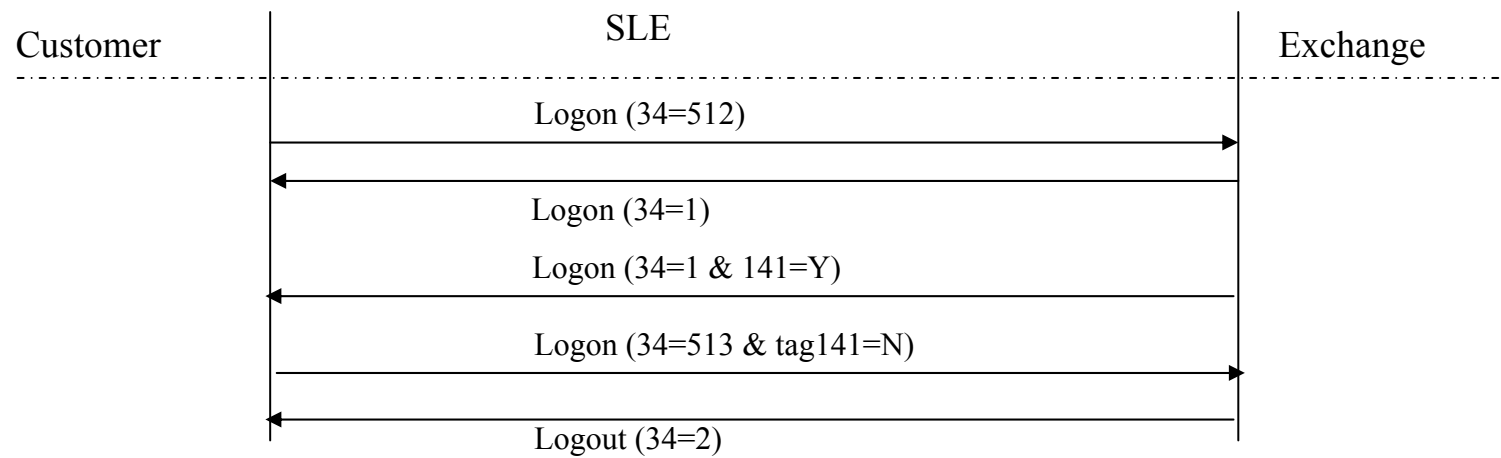
**UNIT 6: LOGON RESET SEQUENCE MANAGEMENT**
**INSTRUCTIONS:**

Side	Instructions	Data Key Fields	Data Layout Reference
Exchange	Exchange advises the customer to Initiate an SLE log-on.		
Customer	Customer initiates an SLE log-on without reset the sequence number	SLE ID valid Authentication data: TAG141<N	FIX msg: Logon (A) 141= ResetSeqNumFlag

COMPLETION CRITERIA:

SLE receives and interprets logon refusal.

DATA FLOW DIAGRAM:



## CYCLE C02: RESTART MANAGEMENT

### CYCLE OBJECTIVES:

This cycle tests the software ability to restart data transmission correctly.

### CYCLE PREPARATION:

- Exchange ensures that the SLE is disconnected.
- Customer checks their connections and make sure that SLE is not logged on.

### CYCLE DESCRIPTION:

UNIT Number	ACTIONS REQUIRED	UNIT COMPLETION CRITERIA
1. First connection of SLE of the day.	Customer initiates SLE for the first time of the day (NextExpectedMsgSeqNumber is not sent or empty) and then send the first message of the day.	<ul style="list-style-type: none"> <li>• SLE session starts correctly.</li> <li>• SLE receives all Beginning of Day unsolicited messages.</li> <li>• SLE data flow correct.</li> </ul>
2. SLE Customer initiated Logout N° 1	Customer disconnects	<ul style="list-style-type: none"> <li>• SLE session terminates correctly.</li> </ul>
3. SLE Restart after Customer initiated Logout N°1	After SLE customer disconnected, customer initiates SLE restart. Then, Exchange sends unsolicited message.	<ul style="list-style-type: none"> <li>• SLE session restarts correctly.</li> <li>• SLE receives unsolicited message.</li> <li>• SLE data flow correct</li> </ul>
5. SLE Restart after Customer initiated Logout N° 2	After a SLE customer initiated logout, Exchange sends unsolicited message then invites customer to initiate SLE restart. Then, customer sends a message.	<ul style="list-style-type: none"> <li>• SLE session restarts correctly.</li> <li>• SLE receives pending message.</li> <li>• SLE transmits message.</li> <li>• SLE data flow correct</li> </ul>
6. Exchange initiated Logout N° 1	Exchange initiates SLE logout	<ul style="list-style-type: none"> <li>• SLE session terminates correctly.</li> <li>• SLE data flow correct</li> </ul>
7. SLE Restart after Exchange initiated Logout N° 1	After an Exchange initiated logout, SLE logged on and initiates SLE connection. Exchange sends an unsolicited message. The SLE processes the message	<ul style="list-style-type: none"> <li>• SLE session restarts correctly.</li> <li>• SLE receives unsolicited message.</li> <li>• SLE transmits message.</li> <li>• SLE data flow correct</li> </ul>
8. Exchange initiated Logout N° 2	Exchange initiates SLE logout	<ul style="list-style-type: none"> <li>• SLE session terminates correctly.</li> <li>• SLE data flow correct</li> </ul>
9. SLE Restart after Exchange initiated	After Exchange initiated SLE logout, Exchange sends	<ul style="list-style-type: none"> <li>• SLE session restarts correctly.</li> </ul>

---

Logout N° 2	unsolicited message then invites customer to initiate SLE restart. Then, customer sends a message	<ul style="list-style-type: none"><li>• SLE receives pending message.</li><li>• SLE transmits message.</li><li>• SLE data flow correct</li></ul>
-------------	---	--

**CYCLE DETAILED INSTRUCTIONS:**

**UNIT 1: FIRST CONNECTION OF DAY.**

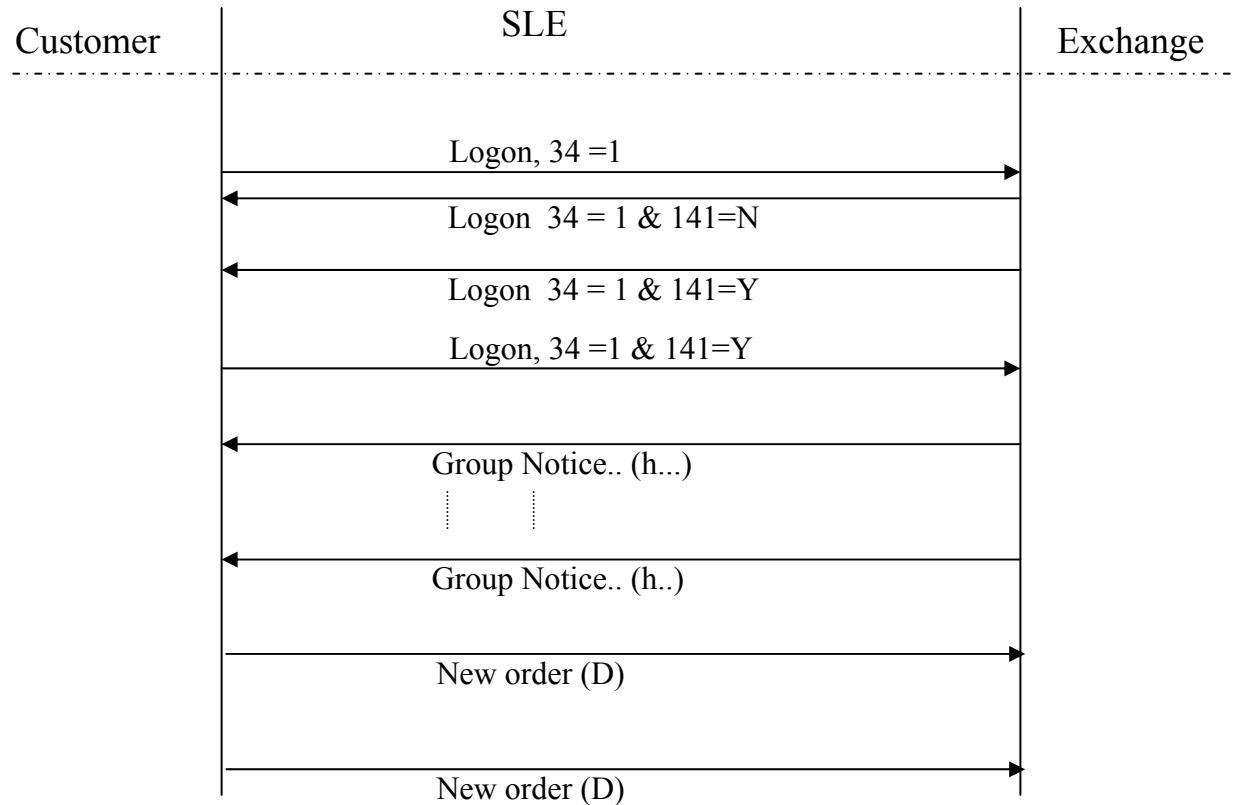
INSTRUCTIONS

Side	Instructions	Data Key Fields	Data Layout Reference
Exchange	Exchange advises the customer to start the test.		
Customer	Customer initiates a SLE logon.	SLE sequence number (TAG34)	FIX msg: 1st Logon message (A)
Exchange	Exchange send a first logon immediately followed by a second logon message	TAG34=1 TAG141=Y	FIX msg: 2nd Logon message (A)
Customer	SLE receives the two logon message and send back a second logon message	TAG34=1 TAG141=Y	FIX msg: 2nd Logon message (A)
Exchange	Exchange checks SLE data flow reception.	SLE send/receives application messages	FIX msg=D (New order single...) FIX msg=h, ...

COMPLETION CRITERIA

- SLE session receive the two logon message
- SLE send a second logon message with the TAG 141(sequence reset) equal to Yes
- SLE data flow correct

DATA FLOW DIAGRAM:



**UNIT 2: SLE 'CUSTOMER INITIATED' LOGOFF N° 1**

## INSTRUCTIONS:

<b>Side</b>	<b>Instructions</b>	<b>Data Key Fields</b>	<b>Data Layout Reference</b>
Exchange	Exchange advises the customer to start the test.		
Customer	Customer disconnects		
Exchange	Exchange checks SLE session terminated correctly.		

## COMPLETION CRITERIA

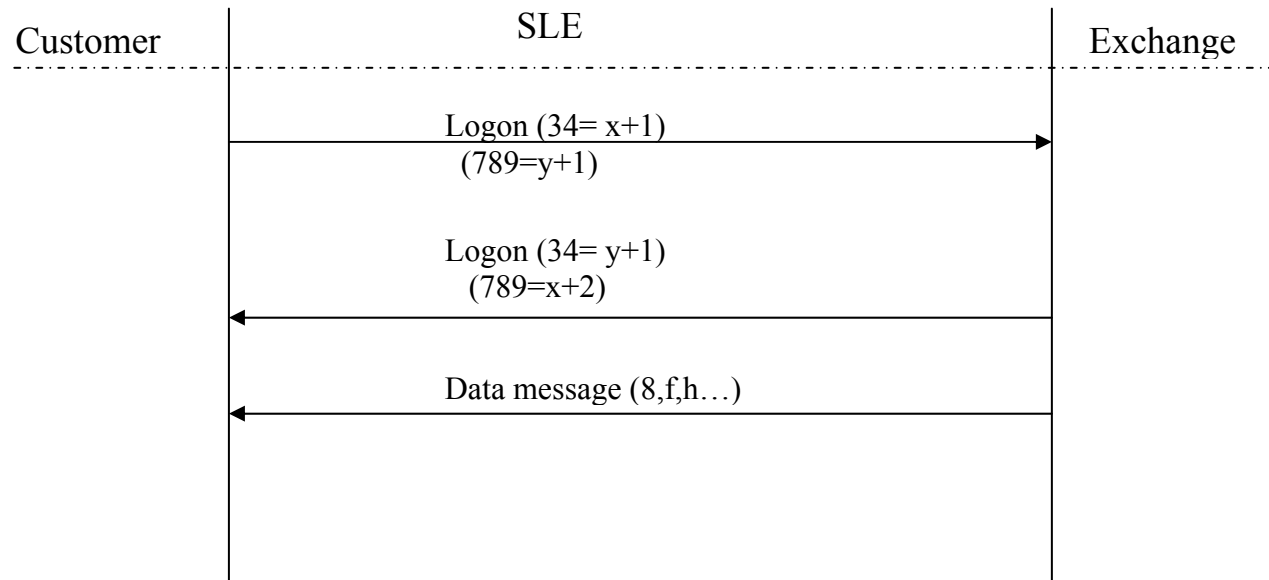
- SLE session terminates correctly.

**UNIT 3: SLE RESTART AFTER ‘CUSTOMER INITIATED’ DISCONNECTION**
**INSTRUCTIONS:**

<b>Side</b>	<b>Instructions</b>	<b>Data Key Fields</b>	<b>Data Layout Reference</b>
Exchange	Exchange advises the customer to start the test.		
Customer	Customer initiates a SLE restart	SLE ID, Authentication data SLE NextExpectedMsgSeqNumber	Logon TAG34 = Next Seq Num
Exchange	Exchange checks SLE restart handshaking.	MsgSeqNumber and NextExpectedMsgSeqNumber within customer logon MsgSeqNumber and NextExpectedMsgSeqNumber within CCG logon	Logon TAG34 = Next Seq Num TAG789 = NextExpectedMsgSeqNumber
Exchange	Exchange sends 1 unsolicited message	CCG MsgSeqNumber incremented with one	
Customer	Customer confirms reception of the unsolicited message.	SLE process the incoming message	
Exchange	Exchange confirms SLE is up and running.		

**COMPLETION CRITERIA**

- SLE session restarts correctly.
- SLE receives unsolicited message.
  - SLE data flow correct

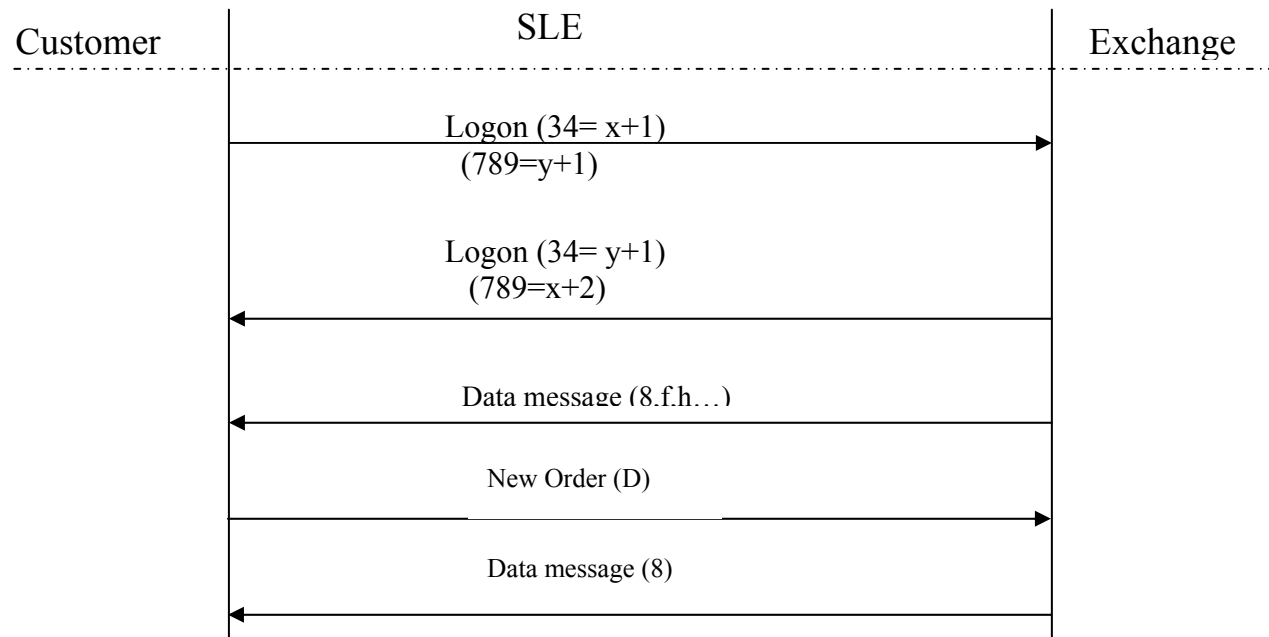


**UNIT 4: SLE RESTART AFTER ‘CUSTOMER INITIATED’ LOGOUT N° 2**
**INSTRUCTIONS:**

<b>Side</b>	<b>Instructions</b>	<b>Data Key Fields</b>	<b>Data Layout Reference</b>
Exchange	Exchange sends 1 unsolicited message		
Exchange	Exchange advises the customer to start the test.		
Customer	Customer initiates a SLE restart	SLE ID, Authentication data SLE NextExpectedMsgSeqNumber	Logon TAG34 = Next Seq Num TAG789 = NextExpectedMsgSeqNumber
Exchange	Exchange checks SLE restart handshaking.	MsgSeqNumber and NextExpectedMsgSeqNumber within customer logon MsgSeqNumber and NextExpectedMsgSeqNumber within CCG logon	Logon TAG34 = Next Seq Num TAG789 = NextExpectedMsgSeqNumber
Customer	Customer confirms reception of pending message	CCG MsgSeqNumber incremented with one	
Customer	Client sends 1 order message	Customer MsgSeqNumber incremented with one	New Order (D) 34= Next Seq Num
Exchange	Exchange confirms reception of order message.	Exchange processes the incoming message	
Exchange	Exchange confirms SLE is up and running.		

**COMPLETION CRITERIA**

- SLE session restarts correctly.
- SLE receives pending message.
- SLE sends message.
  - SLE data flow correct



---

**UNIT 5: SLE 'EXCHANGE INITIATED' LOGOFF N° 1**

INSTRUCTIONS:

<b>Side</b>	<b>Instructions</b>	<b>Data Key Fields</b>	<b>Data Layout Reference</b>
Exchange	Exchange advises the customer to start the test.		
Exchange	Exchange initiates a SLE logged off		
Customer	Customer confirms SLE session terminated correctly.		

## COMPLETION CRITERIA

- SLE session terminates correctly.

**UNIT 6: SLE RESTART AFTER ‘EXCHANGE INITIATED’ LOGOUT N° 1**

INSTRUCTIONS:

Side	Instructions	Data Key Fields	Data Layout Reference
Exchange	Exchange advises the customer to start the test.		
Customer	Customer initiates a SLE restart	SLE ID, Authentication data SLE NextExpectedMsgSeqNumber	Logon TAG34 = Next Seq Num TAG789 = NextExpectedMsgSeqNumber
Exchange	Exchange checks SLE restart handshaking.	MsgSeqNumber and NextExpectedMsgSeqNumber within customer logon MsgSeqNumber and NextExpectedMsgSeqNumber within CCG logon	Logon TAG34 = Next Seq Num TAG789 = NextExpectedMsgSeqNumber
Exchange	Exchange sends 1 unsolicited message	CCG MsgSeqNumber incremented with one	Tag 34
Customer	Customer confirms reception of the unsolicited message.	SLE process the incoming message	
Exchange	Exchange confirms SLE is up and running.		
Customer	Client sends 1 order message	Customer MsgSeqNumber incremented with one	New Order (D) Tag 34
Exchange	Exchange confirms reception of order message.	Exchange processes the incoming message	
Exchange	Exchange confirms SLE is up and running.		

COMPLETION CRITERIA

- SLE session restarts correctly.
- SLE receives unsolicited message.
  - SLE data flow correct

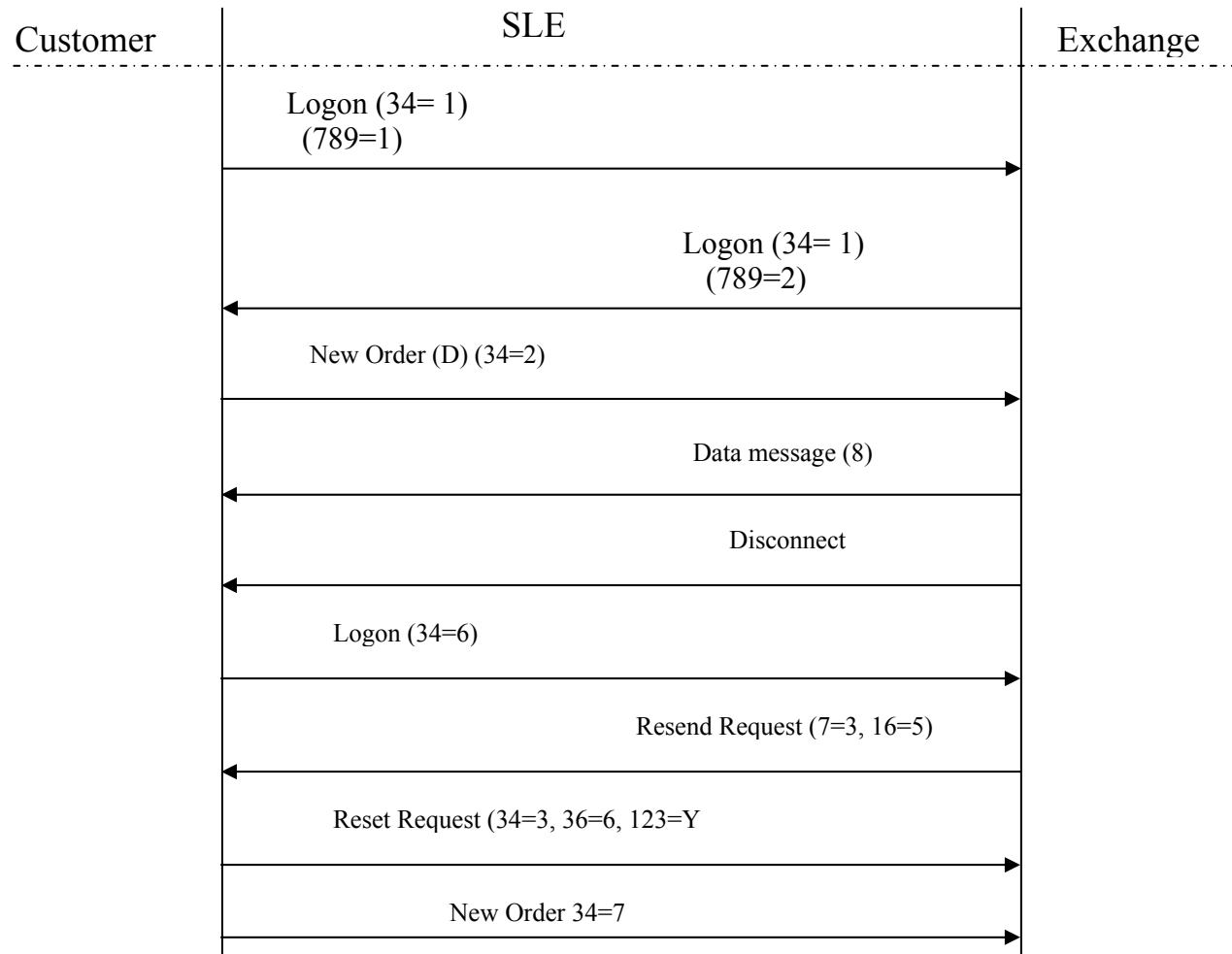
**UNIT 7: SLE GAPFILL**

INSTRUCTIONS:

Side	Instructions	Data Key Fields	Data Layout Reference
Exchange	Exchange advises the customer to start the test.		
Customer	Customer connects	SLE ID, Authentication data MsgSeqNumber and NextExpectedMsgSeqNumber in the login request are correct	Logon TAG34 = MsgSeqNumber TAG789 = NextExpectedMsgSeqNumber
Customer	Customer sends order	MsgSeqNumber increments correctly	TAG34 = MsgSeqNumber
Exchange	Exchange disconnects client		
Customer	Customer reconnects and sends a MsgSeqNumber higher than expected in the login request	SLE ID, Authentication data MsgSeqNumber in the logon request is higher than last MsgSeqNumber sent by client .NextExpectedMsgSeqNumber is correct	Logon TAG34 = MsgSeqNumber TAG789 = NextExpectedMsgSeqNumber
Exchange	Exchange sends Resend Request	CCG sends Resend Request (2) including BeginSeqNumber and EndSeqNumber	Resend Request (2) 7 = BeginSeqNo 16 = EndSeqNo
Customer	Customer sends a GapFill	Customer sends a Sequence Reset (4). Tag 34 contains the same sequence number as the tag 7. Tag 36 contains the new sequence number (same as tag 16 Tag 123 is set to Y	Sequence Reset (4) 34 = MsgSeqNumber 36 = NewSeqNo 123=GapFillFlag
Exchange	Exchange confirms SLE is up and running.		
Customer	Client sends 1 order message	Customer MsgSeqNumber incremented with one	New Order (D) Tag 34
Exchange	Exchange confirms reception of order message.	Exchange processes the incoming message	
Exchange	Exchange confirms SLE is up and running.		

#### COMPLETION CRITERIA

- SLE session restarts correctly.
- SLE receives unsolicited message.
  - SLE data flow correct



## CYCLE C03: RETRANSMISSION MANAGEMENT

### CYCLE OBJECTIVES:

This cycle tests the software ability to replay data reception correctly.

### CYCLE PREPARATION:

- Exchange ensures that the SLE is disconnected.
- Customer checks their connections and make sure that SLE is not logged on.

### CYCLE DESCRIPTION:

UNIT Number	ACTIONS REQUIRED	UNIT COMPLETION CRITERIA
1. SLE Beginning of the day reception replay	Customer initiates SLE Beginning of the Day restart (ie set NextExpectedMsgSeqNumber equal to 1).	<ul style="list-style-type: none"> <li>• SLE session restarts correctly.</li> <li>• SLE receives all Beginning of Day unsolicited messages.</li> <li>• SLE data flow correct.</li> </ul>
2. SLE intraday reception replay.	After SLE customer initiated logout, customer initiates SLE restart from a specific NextExpectedMsgSeqNumber. Then, Exchange resends messages from the requested NextExpectedMsgSeqNumber	<ul style="list-style-type: none"> <li>• SLE session restarts correctly.</li> <li>• SLE receives resent messages.</li> <li>• SLE data flow correct</li> </ul>

**CYCLE DETAILED INSTRUCTIONS:**

**UNIT 1: SLE BEGINNING OF THE DAY RECEPTION REPLAY**

INSTRUCTIONS:

Side	Instructions	Data Key Fields	Data Layout Reference
Exchange	Exchange advises the customer to start the test.		
Customer	Customer initiates a SLE beginning of day restart	NextExpectedMsgSeqNumber equal to 1	Logon (A) 789 = NextExpectedMsgSeqNumber
Exchange	Exchange resend messages		
Customer	Customer confirms retransmission of message.		

COMPLETION CRITERIA

- SLE session restarts correctly.
- SLE receives retransmission of all messages since Beginning of the Day.
  - SLE data flow correct

**UNIT 2: SLE INTRADAY RECEPTION REPLAY.**
**INSTRUCTIONS:**

Side	Instructions	Data Key Fields	Data Layout Reference
Exchange	Exchange advises the customer to start the test.		
Customer	Customer initiates a SLE beginning of day restart	NextExpectedMsgSeqNumber equal to a specific MsgSeqNumber	Logon (A) 789= NextExpectedMsgSeqNumber 34=MsgSeqNumber
Exchange	Exchange resend messages		
Customer	Customer confirms retransmission of message.		

**COMPLETION CRITERIA**

- SLE session restarts correctly.
- SLE receives retransmission of all messages since Beginning of the Day since the specific MsgSeqNumber
  - SLE data flow correct

---

**CYCLE C04: ADMINISTRATIVE MESSAGES MANAGEMENT****CYCLE OBJECTIVES:**

This cycle tests the software ability to send messages

**CYCLE PREPARATION:**

- Exchange ensures that the SLE is disconnected.
- Customer checks their connections and make sure that SLE is not logged.

**CYCLE DESCRIPTION:**

<b>UNIT Number</b>	<b>ACTIONS REQUIRED</b>	<b>UNIT COMPLETION CRITERIA</b>
1. Periodic reception of heartbeats	Customer establish connection without sending any message during a period of time	<ul style="list-style-type: none"><li>• SLE receive heartbeats periodically</li></ul>
2. Test request sent by customer	Customer establish connection without sending any message during a period of time	<ul style="list-style-type: none"><li>• SLE receive heartbeat reply from CCG</li></ul>
3. Test request sent by CCG	Customer establish connection without sending any message during a period of time	<ul style="list-style-type: none"><li>• SLE reply with heartbeat</li></ul>

**CYCLE DETAILED INSTRUCTIONS:****UNIT 1- PERIODIC RECEPTION OF HEARTBEATS**

## INSTRUCTIONS:

Side	Instructions	Data Key Fields	Data Layout Reference
Exchange	Exchange advises the customer to begin test		.
Customer	Customer initiates a SLE start	LastMsgSeqNum equal to last message received	Logon (A)
Customer	Customer confirm reception of periodic reception of heartbeats		HeartBeat (0)

## COMPLETION CRITERIA:

- SLE receive heartbeats periodically

**UNIT 2- TEST REQUEST SENT BY CUSTOMER**
**INSTRUCTIONS:**

<b>Side</b>	<b>Instructions</b>	<b>Data Key Fields</b>	<b>Data Layout Reference</b>
Exchange	Exchange advises the customer to begin test		.
Customer	Customer initiates a SLE start	LastMsgSeqNum equal to last message received	Logon (A)
Customer	Customer provoke emission of Test Request		Test Request (1)
Exchange	Exchange confirm reception of Test Request		
Customer	Customer confirm reception of heartbeat		

**COMPLETION CRITERIA:**

- SLE receives heartbeat reply from CCG.

**UNIT 3- TEST REQUEST SENT BY EXCHANGE**
**INSTRUCTIONS:**

<b>Side</b>	<b>Instructions</b>	<b>Data Key Fields</b>	<b>Data Layout Reference</b>
Exchange	Exchange advises the customer to begin test		.
Customer	Customer initiates a SLE start	LastMsgSeqNum equal to last message received	Logon (A)
Exchange	Exchange provoke emission of Test Request		Test Request (1)
Customer	Customer confirm reception of Test Request		
Exchange	Exchange confirm reception of heartbeat		

**COMPLETION CRITERIA:**

- SLE reply with heartbeat correctly

---

## **CYCLE C05: PREFIX AND INSTANCE FOR CLORDID**

### **CYCLE OBJECTIVES:**

This cycle is split in two sections. The first cycle concerns an access of a Service Bureau via an ASP. The second cycle concerns a regular access of a client.

The term “Regular Access” is used in the following case: When a firm contracts directly its own and exclusive order entry access mean with NYSE Euronext, the Firm Trading Solution type is called Regular Access.

The term “Service Bureau Access” is used in the following case: When a 3<sup>rd</sup> party customer, also named Service Bureau, contracts order entry access mean with NYSE Euronext to act as an order carrier on behalf of several firms, the Firm Trading Solution type is called Service Bureau Access.

The ClOrdID value assigned to any given order must be unique for the Firm across all available connections.

To ensure for a given firm there is no conflict among its several CCG accesses, the exchange has put in place a "mandatory prefix policy" and highly recommends an optional "instance prefix policy"

This cycle tests the software ability to respect the format of the ClOrderID.

### **Mandatory prefix in FIX4.2:**

- Regular Access: must not start any ClOrdID value with the ‘-‘ character.
- Service Bureau:
  - Must start all ClOrdID values with the ‘-‘ character.

### **AND**

- The next three characters must be populated with the unique 3-digit number assigned to the Service Bureau by the exchange..

### **Recommended Instance prefix in FIX4.2:**

The exchange recommends to use a 2-character prefix (must be numerical if Firm requires UTP Direct

vs UTP-FIX.4.2 compatibility – see also section 1.6). This prefix should be placed in the following locations within the ClOrdID value, depending on access type:

- Regular Access: The 2 leading characters, keeping in mind the “mandatory prefix policy”
- Service Bureau: The next 2 characters after the mandatory ‘-‘ character and the 3-character Service Bureau prefix

### **Important notes:**

1- “Software Vendors” and “In house” developers must be able to extend the instance prefix size for firm which has more instances than the 2-character prefix available combinations can cover.

2- “Software Vendors” and “In house” developers must be able to encode Instance prefix as numerical if Firm requires UTP-Direct vs UTP-FIX.4.2 compatibility.

**CYCLE PREPARATION:**

- In case of an ASP, exchange verifies that the prefix has been configured
- Customer checks their connections and make sure their SLE is able to log in.

**CYCLE DESCRIPTION:**

SERVICE BUREAU (FOR ASP)

UNIT Number	ACTIONS REQUIRED	UNIT COMPLETION CRITERIA
1a. Order entry for prefix	Customer sends order with valid prefix	<ul style="list-style-type: none"> <li>• Customer confirms acknowledgment of order</li> <li>• Exchange confirms ClOrdID has a negative value</li> <li>• Exchange confirms ClOrdID has the correct prefix</li> </ul>
1b.. Order entry for different prefix	Customer sends order with prefix 002	<ul style="list-style-type: none"> <li>• Exchange confirms ClOrdID has a negative value</li> <li>• Exchange confirms ClOrdID has the prefix 002</li> </ul>
2a. Order entry for prefix and instance 01	Customer sends order with valid prefix and instance 01	<ul style="list-style-type: none"> <li>• Customer confirms acknowledgment of order</li> <li>• Exchange confirms ClOrdID has a negative value</li> <li>• Exchange confirms ClOrdID has the correct prefix</li> <li>• Exchange confirms ClOrdID contains the instance 01</li> </ul>
2b. Order entry for prefix and instance 02	Customer sends order with valid prefix and instance 02	<ul style="list-style-type: none"> <li>• Customer confirms acknowledgment of order</li> <li>• Exchange confirms ClOrdID has a negative value</li> <li>• Exchange confirms ClOrdID has the correct prefix</li> <li>• Exchange confirms ClOrdID contains the instance 02</li> </ul>
3. Incorrect prefix	Customer sends order with invalid prefix	<ul style="list-style-type: none"> <li>• Customer confirms rejection of order</li> </ul>
4. Migration of FIX 4.2 to UTP Direct (optional test)	<ul style="list-style-type: none"> <li>• Customer send order with protocol FIX 4.2</li> <li>• Customer modifies order with protocol UTP Direct via a different connection</li> </ul>	<ul style="list-style-type: none"> <li>• Customer confirms he can modify the order (to complete this scenario the ClOrdID needs to contain only numeric characters)</li> </ul>
5. Drop copy	<ul style="list-style-type: none"> <li>• Customer sends order with valid prefix</li> <li>• Exchange executes order</li> </ul>	<ul style="list-style-type: none"> <li>• Customer confirms receipt of the execution on the drop copy channel (if customer has a drop copy using UTP Direct the ClOrdID needs to contain only numeric characters)</li> </ul>

## REGULAR ACCESS

UNIT Number	ACTIONS REQUIRED	UNIT COMPLETION CRITERIA
<b>1a.</b> Order entry for two bytes	Customer sends order with instance 01	<ul style="list-style-type: none"> <li>• Customer confirms acknowledgment of order</li> <li>• Exchange confirms CIOrdID has a positive value</li> <li>• Exchange confirms CIOrdID contains the instance 01</li> </ul>
<b>1b.</b> Order entry for two bytes	Customer sends order with instance 02	<ul style="list-style-type: none"> <li>• Customer confirms acknowledgment of order</li> <li>• Exchange confirms CIOrdID has a positive value</li> <li>• Exchange confirms CIOrdID contains the instance 02</li> </ul>
<b>1a.</b> Order entry for three bytes	Customer sends order with instance 001	<ul style="list-style-type: none"> <li>• Customer confirms acknowledgment of order</li> <li>• Exchange confirms CIOrdID has a positive value</li> <li>• Exchange confirms CIOrdID contains the instance 001</li> </ul>
<b>1b.</b> Order entry for three bytes	Customer sends order with instance 002	<ul style="list-style-type: none"> <li>• Customer confirms acknowledgment of order</li> <li>• Exchange confirms CIOrdID has a positive value</li> <li>• Exchange confirms CIOrdID contains the instance 002</li> </ul>
<b>4.</b> Migration of FIX 4.2 to UTP Direct (optional test)	<ul style="list-style-type: none"> <li>• Customer send order with protocol FIX 4.2</li> <li>• Customer modifies order with protocol UTP Direct via a different connection</li> </ul>	<ul style="list-style-type: none"> <li>• Customer confirms he can modify the order (to complete this scenario the CIOrdID needs to contain only numeric characters)</li> </ul>
<b>5.</b> Drop copy	<ul style="list-style-type: none"> <li>• Customer sends order with valid prefix</li> <li>• Exchange executes order</li> </ul>	<ul style="list-style-type: none"> <li>• Customer confirms receipt of the execution on the drop copy channel (if customer has a drop copy using UTP Direct the CIOrdID needs to contain only numeric characters)</li> </ul>

## **II- SLE PROFILE**

**CYCLE P01: TRADING SUBSCRIPTION MANAGEMENT - UNSOLICITED MESSAGES**

**CYCLE P02: TRADING SUBSCRIPTION MANAGEMENT - SOLICITED MESSAGES**

**CYCLE P03: MULTI-MARKET SUBSCRIPTION**

**CYCLE P04: MULTI-MEMBER SUBSCRIPTION (SERVICE BUREAU/ASP ONLY)**

**CYCLE P01: TRADING SUBSCRIPTION MANAGEMENT – PRIVATE UNSOLICITED MARKET MESSAGES**

**CYCLE OBJECTIVES:**

This cycle tests SLE ability to receive and interpret private unsolicited market messages from all subscribed trading systems.

**CYCLE PREPARATION:**

- Exchange ensures that the SLE is logged on.
- Customer checks their connections and make sure that SLE is logged on.

**CYCLE DESCRIPTION:**

System	UNIT Number	ACTIONS REQUIRED	UNIT COMPLETION CRITERIA
UTP	1. Order cancelled (order cancelled by surveillance)	Customer enters orders. Exchange cancel during the market session all the orders sent by the customer. Customer checks reception of this message for each order still alive in its book.	<ul style="list-style-type: none"> <li>• SLE receives and interprets message (8), 150=4, 20=0, 39=S</li> </ul>
	2. Order eliminated (Corporate action in post session)	Customer enters orders. Exchange cancels all his orders for a corporate action on that security during the post-market session. Customer checks reception of this message for each order still alive in its book for this security.	<ul style="list-style-type: none"> <li>• SLE receives and interprets message (8), 150=O, 39=0, 39=O</li> </ul>
	3. Remaining Order reject due to collar breach	Customer enters a valid limited order that can be executed but breach the collar and checks reception of remaining quantity reject.	<ul style="list-style-type: none"> <li>• SLE receives and interprets order outcome message (8) following partial execution (8) and elimination (8)</li> </ul>
	4. Order elimination (IOC order partially executed )	Customer enters a IOC order during continuous session likely to be partially filled. Customer checks reception of partial fill (8) and kill (8).	<ul style="list-style-type: none"> <li>• SLE receives and interprets order outcome message (8) following execution (8) and elimination (8)</li> </ul>

UTP	<b>5. Orders elimination (Global cancellation by the member)</b>	Customer enters orders. Member cancels during the market session all his orders for a given security using global cancellation.. Customer checks reception of Order killed message for each order still alive in its book for this security.	<ul style="list-style-type: none"> <li>SLE receives and interprets private unsolicited market messages (8)</li> </ul>
	<b>6. Orders elimination (Global cancellation by the Exchange)</b>	Customer enters orders. Exchange cancels all his orders during the market session all his orders. Customer checks reception of Order killed message for each order still alive in its book.	<ul style="list-style-type: none"> <li>SLE receives and interprets private unsolicited market messages (8), 150=4, 39=0, 20=S</li> </ul>
	<b>7. Order Replaced</b>	Customer enters an order during the market session. Then Customer modifies this order. Customer checks the reception of Order Replaced (8) 150=E, after reception of Order Cancel Replace Ack (8) 150=5.	<ul style="list-style-type: none"> <li>SLE receives and interprets private unsolicited market messages (8), 150=E that follows solicited message (8), 150=5</li> </ul>
	<b>8. Execution notice (order partially filled)</b>	Exchange places some liquidity in a given security and invite customer to enter an order that partially trades. Customer checks reception of one or several partial fill message(s).	<ul style="list-style-type: none"> <li>SLE receives and interprets private unsolicited market message(s) (8), 150=1, 20=0, 39=1</li> </ul>
	<b>9. Execution notice (order fully filled)</b>	Exchange places some liquidity in a given security and invite customer to enter an order that fully trades. Customer checks reception of one or several fill message(s).	<ul style="list-style-type: none"> <li>SLE receives and interprets private unsolicited market message(s) (8), 150=2, 20=0, 39=2</li> </ul>
	<b>10. Trade creation.</b>	Customer is involved in a trade. Exchange cancels this trade. Customer checks reception of this message.	<ul style="list-style-type: none"> <li>SLE receives and interprets private unsolicited market message (8), 150=2, 20=0, 39=2</li> </ul>
	<b>11. Trade cancelled.</b>	Customer is involved in a trade. Exchange cancels this trade. Customer checks reception of this message.	<ul style="list-style-type: none"> <li>SLE receives and interprets private unsolicited market message (8), 150=2, 20=1</li> </ul>

## CYCLE P03: TRADING SUBSCRIPTION MANAGEMENT – SOLICITED MARKET MESSAGES

### CYCLE OBJECTIVES:

This cycle tests SLE ability to receive and interpret solicited market messages from all subscribed trading systems.

### CYCLE PREPARATION:

- Exchange ensures that the SLE is logged on.
- Customer checks their connections and make sure that SLE is logged on..

### CYCLE DESCRIPTION:

System	UNIT Number	ACTIONS REQUIRED	UNIT COMPLETION CRITERIA
VE/VW/VL	1. New Order outcome Ack	Customer enters a valid limited order not executed and checks reception of ack message.	<ul style="list-style-type: none"> <li>• SLE receives and interpret message (8)</li> </ul>
	2. Cancel/Replace Request Ack	Customer modifies a valid limited order not executed and checks reception of ack and confirmation messages.	<ul style="list-style-type: none"> <li>• SLE receives and interprets messages (8), 150=E, 20=0, 39=E then (8), 150=5, 20=0</li> </ul>
	3. Cancel Request Ack	Customer cancel a valid limited order and checks reception ack and confirmation messages	<ul style="list-style-type: none"> <li>• SLE receives and interpret messages (8), 150=6, 20=0, 39=6 then (8), 150=4</li> </ul>
	4. Order Reject	Customer enters an invalid limited order and checks reception of order reject.	<ul style="list-style-type: none"> <li>• SLE receives and interpret message (8), 150=8, 20=0, 39=8</li> </ul>
	5. Cancel Replace Reject	Customer modifies an invalid limited order and checks reception of replace reject.	<ul style="list-style-type: none"> <li>• SLE receives and interpret message (8)</li> </ul>
	6. Cancel Reject	Customer cancels an invalid limited order and checks reception of cancel reject.	<ul style="list-style-type: none"> <li>• SLE receives and interpret message (8)</li> </ul>

## CYCLE P04: MULTI-MARKET SUBSCRIPTION

### CYCLE OBJECTIVES:

This cycle tests the software ability to receive and interpret incoming market messages from all subscribed trading engines : UTP , NYSE ARCA EUROPE.

### CYCLE PREPARATION:

- Exchange ensures that the SLE is logged on.
- Customer checks their connections and make sure that SLE is logged on.

### CYCLE DESCRIPTION:

UNIT Number	ACTIONS REQUIRED	UNIT COMPLETION CRITERIA
1. Multi-Market Reception.	Customer checks reception of market messages coming from each trading engine customer has subscribed.	<ul style="list-style-type: none"> <li>• SLE receives and interprets unsolicited market messages from each trading engine customer has subscribed.</li> </ul>
2. Multi-Market Emission.	Customer enters an order for each trading engine customer has subscribed.	<ul style="list-style-type: none"> <li>• SLE transmits orders for each trading engine customer has subscribed.</li> </ul>

**CYCLE P05: MULTI-MEMBER SUBSCRIPTION (SERVICE BUREAU/ASP ONLY)**

**CYCLE OBJECTIVES:**

This cycle tests the SLE ability to manage emission and reception of all market messages belonging to each member SLE is entitled to route.

**CYCLE PREPARATION:**

- Exchange ensures that the SLE is logged on.
- Customer checks their connections and make sure that SLE is logged on..

**CYCLE DESCRIPTION:**

<b>UNIT Number</b>	<b>ACTIONS REQUIRED</b>	<b>UNIT COMPLETION CRITERIA</b>
1. Multi-Member Emission.	Customer checks reception of market messages belonging to each member SLE is entitled to route.	<ul style="list-style-type: none"> <li>• SLE receives and interprets market messages belonging to each member SLE is entitled to route.</li> </ul>
2. Multi-Member Reception.	Customer enters an order for each member SLE is entitled to route.	<ul style="list-style-type: none"> <li>• SLE transmits order for each member SLE is entitled to route.</li> </ul>
3. Member Versus Subscriber Mapping.	Customer enters an order for two members related to different SLE.	<ul style="list-style-type: none"> <li>• Each order is routed by the right SLE.</li> </ul>

## **III- HIGH AVAILABILTY**

### **CYCLE H01: CCG BINARY FAIL-OVER MANAGEMENT**

## CYCLE H01: CCG BINARY FAIL-OVER MANAGEMENT

### CYCLE OBJECTIVES:

This cycle tests the software ability to recover following a CCG fail over :

- ability to detect message received duplicate
- ability to resend or not resend orders sent gap , in accordance of customer order retransmission policy.

### CYCLE PREPARATION:

- Exchange ensures that the SLE is connected.
- Customer checks their connections is up and running
- Exchange invite customer to send orders in a sustained manner, then immediately provoke a fail over of CCG binary.

### CYCLE DESCRIPTION:

UNIT Number	ACTIONS REQUIRED	UNIT COMPLETION CRITERIA
1. Logon handshake recovery	Customer reconnects immediately his SLE	<ul style="list-style-type: none"> <li>• SLE reconnects correctly</li> </ul>
2. Reception recovery	CCG resumes transmission of messages	<ul style="list-style-type: none"> <li>• SLE resumes reception correctly and is able to detect any application message duplicate</li> </ul>
3. Emission recovery	SLE resumes transmission of messages	<ul style="list-style-type: none"> <li>• SLE resumes emission correctly and is able to detect and deal with any orders sent gap.</li> </ul>

**CYCLE DETAILED INSTRUCTIONS:**

**UNIT 1- LOGON HANDSHAKE RECOVERY**

INSTRUCTIONS:

Side	Instructions	Data Key Fields	Data Layout Reference
Customer	Customer initiates a SLE start	LastMsgSeqNum equal to last message received	Logon (A)
Customer	Customer confirms SLE up and running	LastMsgSeqNum within customer logon LastMsgSeqNum within CCG logon	Logon (A)
Exchange	Exchange checks SLE restart handshaking.	LastMsgSeqNum within customer logon LastMsgSeqNum within CCG logon	Logon (A)

COMPLETION CRITERIA:

- SLE reconnects correctly

---

**UNIT 2- . RECEPTION RECOVERY****INSTRUCTIONS:**

<b>Side</b>	<b>Instructions</b>	<b>Data Key Fields</b>	<b>Data Layout Reference</b>
Customer	Customer checks data received and confirms that software is able to detect any application message duplicate.	MsgSeqNum	.

**COMPLETION CRITERIA:**

- SLE resumes reception correctly and is able to detect any application message duplicate.

**UNIT 3- EMISSION RECOVERY**
**INSTRUCTIONS:**

<b>Side</b>	<b>Instructions</b>	<b>Data Key Fields</b>	<b>Data Layout Reference</b>
Customer	Customer checks orders sent gap	LastMsgSeqNum within CCG logon	Logon (A)
Customer	Customer checks whether SLE has resent the gap fill.		.
Exchange	Exchange checks if customer has sent any order duplicate	MsgSeqNum	

**COMPLETION CRITERIA:**

- SLE resumes emission correctly and is able to detect and deal with any orders sent gap, in accordance of customer order retransmission policy.

## ANNEX1- FAIL-OVER RECOVERY DATA FLOW KINEMATICS

