

Johannesburg Stock Exchange

Post-trade Services

JSE Guidance Note

Volume PT204 – Guide to Mandatory Clearing Member Testing (MCMT)

Version	2.0
Release Date	20 December 2017
Number of Pages	1920 (Including Cover Page)

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1 DOCUMENT CONTROL

1.1 Document information

Drafted By	JSE Post-trade Services
Status	Revised version
Version	2.0
Release Date	20 December 2017

1.2 Revision history

Date	Version	Description
22 August 2017	1.00	Initial published version
20 December 2017	1.1	Revised approach and timeline

1.3 References

Note: The documents in the table below are published on the ITaC website: <https://www.jse.co.za/services/itac>

Name	Description
Trading Related	
Volume 00D - Trading and Information Overview for the Derivative Markets	Provides an overview of the JSE trading services and capabilities for the Derivatives Markets
Volume 00E - Trading and Information Overview for the Equity Market	Provides an overview of the JSE trading services and capabilities for the Equity Market
Post-trade Related	
Volume PT01 – Post-trade EMAPI Common	Describes the semantics and syntax of the common or session/admin EMAPI protocol messages.
Volume PT02 – Post-trade EMAPI Clearing	Describes the semantics and syntax of the clearing or application messages of the EMAPI protocol.
Volume PT03 - Post-trade Margining Methodology Specification (JSPAN)	Describes in detail the JSE margin methodology including all calculations used in deriving margins
EmapiTransactionsForMember.html	HTML file describing the syntax of all EMAPI protocol messages for market participants i.e. clearing and trading members
EmapiTransactionsForMember.xml	XML definition of all EMAPI protocol messages for market participants i.e. clearing and trading members
EmapiTransactions.xsd	XML schema for EMAPI messages defined in "EmapiTransactionsForMember.xml"
EMAPI TagWire	Describes the syntax of the TagWire encoding of EMAPI messages
Volume PT204 – Guide to Mandatory Clearing Member Testing (MCMT)	Guidance note providing Clearing Members and their software providers with an overview of how the JSE Mandatory Clearing Member Testing (MCMT) phase for the JSE ITaC project will be conducted

Volume PT204a - Test scenarios for MCMT	List of test scenarios to be used during the MCMT phase
Volume PT204b - Transactional data pack for MCMT	Data pack containing all transaction/trade data that will be used during the MCMT phase
Volume PT204c - Test execution schedule for MCMT	The test execution schedule for MCMT i.e. sequence of scenario execution
Volume PT204d - Test tracking sheet for MCMT	Test tracking sheet to be used during MCMT (to be published in due course)

1.4 Contact details

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1.6 Definitions, acronyms and abbreviations

Term/Abbreviation/Acronym	Description
VCMT	<u>Voluntary Clearing Member Testing:</u> This is a passive phase of testing being offered by the JSE to its Clearing Members and software providers, to assist them in testing their own solutions. This phase of testing is voluntary, and while participation is advised it is not mandated by the exchange.
RTC	The JSE Real Time Clearing (RTC) system
MCMT	<u>Mandatory Clearing Member Testing:</u> This phase of testing is mandatory, and is a pre-requisite for all Clearing Members going live with the JSE ITaC project. The MCMT phase will cover the full scope of ITaC testing for the Post-trade Services solution, including billing.
Test scenarios	The detailed test scenarios that will be executed during the MCMT test phase. Clearing Members are encouraged to review the test scenarios and suggest any additional scenarios they would like executed.
Transactional data pack	This is a document that describes the data to be utilised for each of the test scenarios, which will be shared a day prior to the scheduled execution of the respective scenario(s).
Test schedule	This is a document that describes the day to day schedule (sequence) according to which the test scenarios will be executed.
Test tracking sheet	This is a reporting template to be populated by the Clearing Member Test Manager to indicate both the progress and success of the test execution process
CSC Team	Client Service Centre (CSC): These are JSE resources responsible for assisting clients in the resolution of queries, requests and issues during the various test phases. They are the first point of contact during testing (as well as for all production related queries).

1.7 Document purpose

The purpose of this document is to provide Clearing Members and their software providers with guidance as to how the JSE Mandatory Clearing Member Testing (MCMT) process for the JSE ITaC project will be run. Key elements of this guide include:

- Key principles of MCMT
- Entry and exit criteria

- High-level testing scope
- High-level view of daily run schedule
- Testing processes and procedures
- Testing progress status updates
- Defect and query logging process
- Data preparations and requests

1.8 Document exclusions

Any items not listed in this document are excluded from the scope of this document, however for further clarity the following requirements are explicitly excluded (document references for items out of scope have been inserted where relevant):

No.	Requirements	Description
1	Volume testing	Volume testing will not be part of the VCMT and MCMT phase of testing. It will be executed as part of the dress rehearsals.
2	Resilience (failover and disaster recovery) testing	Resilience testing will not be part of the VCMT and MCMT phase of testing. Clients will have an opportunity in the dress rehearsals to test their high availability/ disaster recovery processes into the JSE primary site. Resilience testing into the JSE's disaster recovery site will be done at a later stage.
3	Foreign currency collateral	Out of scope of VCMT and MCMT as after consultations with clients FX collateral has been removed from ITaC Project 1 scope

2 OVERVIEW

The purpose of this document is to provide clients with the required information to participate in the Mandatory Clearing Member Testing (MCMT) phase of the JSE ITaC project. The MCMT phase will follow-on from the Voluntary Clearing Member Testing (VCMT) phase where Clearing Members would have had the opportunity to perform general testing of their connectivity and majority of their clearing functions and processes with the JSE clearing system (i.e. RTC). The primary objective of the MCMT phase is to ensure that Clearing Members prove that their software solutions and business processes are ready for the go-live of the new JSE clearing system. The testing will cover the full range of clearing functionalities and processes and will include the run-through of all scenarios that are typically experienced during regular business days, as well as others that are more periodic and ad-hoc.

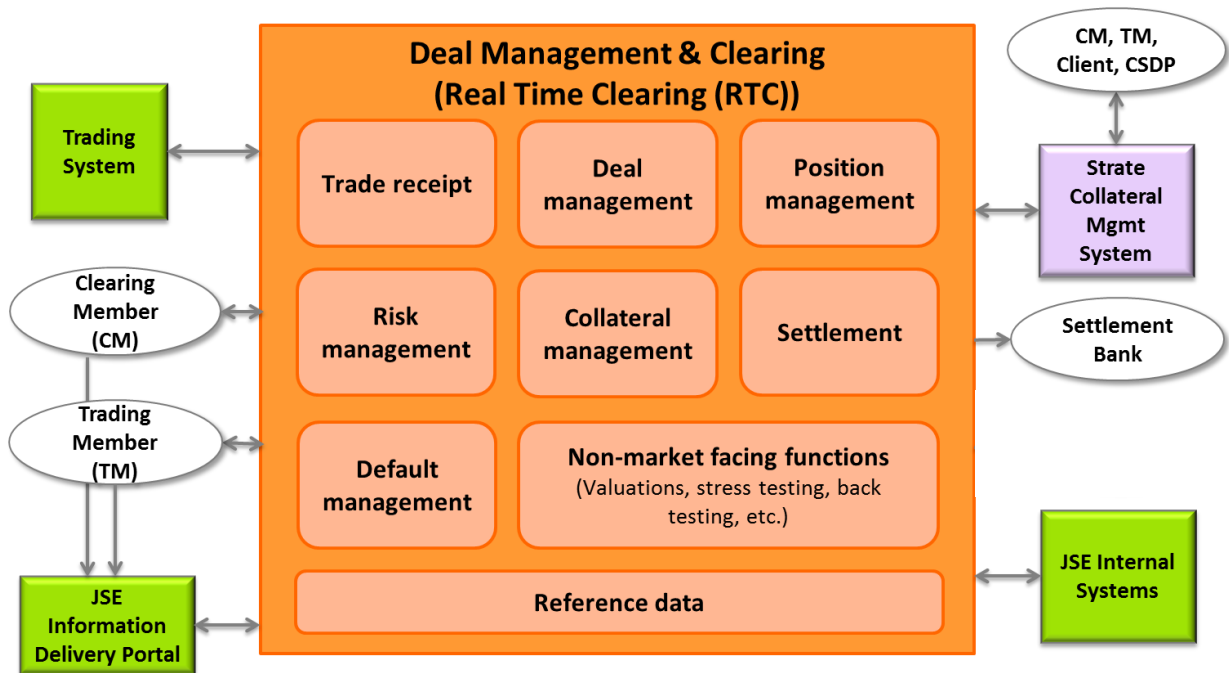
All Clearing Members will be required to participate and successfully complete the MCMT phase. Trading Members will be involved in MCMT, whilst software providers will not. The MCMT phase will follow a formal testing and sign-off approach that will be tracked and monitored closely by the JSE.

The following documentation should be read in conjunction with this document to gain a better understanding of all the functions and processes that are applicable in the new JSE clearing solution: [Volume PT00 – Post-trade Services Overview](#)

(Web link: <https://www.jse.co.za/services/itac>)

3 Derivative post-trade testing landscape

The following diagram provides an overview of the JSE derivative post-trade services that will form part of MCMT.



4 Mandatory Clearing Member Testing (MCMT)

The primary objective of MCMT is for Clearing Members to comprehensively test all messaging interfaces, system functionalities and business processes with the JSE, in order to be ready for go-live. The same entry criteria applicable for VCMT will be applied for MCMT (refer to '[Entry and Exit Criteria](#)' section). MCMT will be conducted using the same JSE test environment used for VCMT – TB50.

Below is a high-level overview of what Clearing Members can expect during MCMT:

- MCMT will follow-on from VCMT testing and leverage off the high-level scope, scenarios and execution sequence thereof
- MCMT testing will be scripted i.e. pre-defined scenarios and will follow a detailed testing schedule (day to day sequence of execution) as defined by the JSE.
- MCMT is intended to test the full scope of the JSE clearing functionality and processes, as opposed to the subset of functionality as tested in VCMT
- Clearing Members will be given the opportunity to request specific transactional and reference data for the execution of test scenarios that are not specified in the MCMT 'Test scenarios' published by the JSE
- Clearing Members may request to be exempted from certain functions/test scenarios that they feel are not relevant to their offering, e.g. Collateral, however this would need to be formally agreed to upfront with the JSE and noted on their 'Test scenario' document (as mentioned in the '[Entry criteria](#)' section of this document)
- It is imperative that Clearing Members execute all MCMT testing using the latest versions of their in-house developed solutions or solutions provided by their software providers
- It is also imperative that all Clearing Members start and end MCMT on the same dates specified and agreed upon with the JSE
- As defined in the '[Definitions, acronyms and abbreviations](#)' section above, the following JSE provided documentation/templates will be applicable during MCMT:
 - Test scenarios (published on the JSE website)
 - Transactional data pack (to be published to the JSE website in due course)
 - Test execution schedule (updated version published together with this document)
 - Test tracking sheet (to be published to the JSE website in due course)
- In addition, any new release of significantly new or changed functionality (if required) by the JSE may also result in regression testing, and in some cases re-conformance of Clearing Member software solutions
 - The JSE will communicate and confirm if regression testing is required per new release

4.1 Test execution schedule

MCMT will be conducted over a 5 two-week cycles. Test execution during MCMT will be performed on a daily basis according to a predefined test execution schedule. Test cases

will either be executed by the JSE (with Clearing Members validating the outputs) or individually by each of the Clearing Members. Test execution during this phase is broken into three categories:

- **Daily base scenario execution** – a set of common base test scenarios that will be planned for execution on a daily basis throughout the MCMT phase. The order of execution, and the amount and the number of re-executions of defined cycle set will not be prescribed by the JSE. Clearing Members will have the opportunity to test and retest these scenarios every day during that functions pre-defined cycle in the MCMT phase. Examples of these types of scenarios include: Reference data downloads, deal and position management, commissions, position updates, intraday risk monitoring, EoD margin and fees balancing.
- **Incremental scenario execution** – a set of test scenarios that will be increased, in terms of number of scenarios and complexity, as the MCMT phase progresses. The intention is for MCMT to transition from basic test scenario execution and build up to more complex scenario execution. As test scenarios incrementally build up, Clearing Members will have the opportunity to retest all scenarios that have built up from the start of MCMT. An example of this type of incremental scenario includes the progression from simple to complex corporate actions.
- **Fixed scenario execution** – a set of test scenarios that will be planned for execution on particular days during the MCMT phase. These test scenarios will be repeated a few times over the duration of the MCMT phase to allow Clearing Members who have missed or fail test executions, to retest. Examples of these types of scenarios include: Futures Closeout (FCO), Intraday Margin Call, and EoD Reruns.

The diagram below provides an illustrative view of the test execution approach to be adopted during MCMT phase.

No.	Test Scenario	Cycle 1a					Cycle 1b					Checkpoint
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	
1	Base scenario execution											
1.1	Base scenario 1	X	X	X	X	X	X	X	X	X	X	
1.2	Base scenario 2	X	X	X	X	X	X	X	X	X	X	
1.3	Base scenario 3	X	X	X	X	X	X	X	X	X	X	
...	...											
2	Incremental scenario execution											
2.1	Incremental scenario 1	X	X	X	X	X	X	X	X	X	X	
2.2	Incremental scenario 2					X	X	X	X	X	X	
2.3	Incremental scenario 3							X	X	X	X	
...	...											
3	Fixed scenario execution											
3.1	Fixed scenario 1		X					X				
3.2	Fixed scenario 2					X					X	
3.3	Fixed scenario 3			X					X			
...	...											

5 ENTRY AND EXIT CRITERIA

5.1 Entry Criteria

Prior to joining the MCMT test phase, all Clearing Members must have:

- A. Signed the updated JSE Services Agreement (JSA) or have agreed with the JSE that the JSA will be signed later prior to go-live
- B. Completed the JSE's technical connectivity and user enablement process
- C. Fully conformed all software applications connecting to the test environment (note: Clearing Members do not need to conform vendor-provided solutions themselves, this will be done by the software vendor)
- D. Must have agreed and signed-off on the scope of testing, test scenarios (including any additional scenarios that may be required) and schedule
- E. Provide the JSE with the details of their assigned Test Manager

NB. Unlike VCMT, software providers may not test on-behalf of Clearing Members during MCMT

The JSE, in consultation with Clearing Members, will collectively confirm the entry of each new cycle.

5.2 Exit Criteria

While there are no formal exit criteria for VCMT, the following criteria will be targeted for MCMT:

- 100% test scenario coverage
- 95% test execution pass rate
- all 'Critical' or 'High' severity defects are closed
- all 'Medium' and/or 'Low' defects are agreed and have workarounds in place

The JSE, in consultation with Clearing Members, will collectively confirm the successful exit of each testing cycle.

6 HIGH-LEVEL TESTING SCOPE

The table below provides a high-level view of the various functions that will form part of the VCMT and MCMT scope.

Function	Category	In scope VCMT	In scope MCMT
Deal and Position Management	<ul style="list-style-type: none"> • Allocations to Member clients • Assignment of deals to trading members • Tripartite assign • Accumulation • Allocation correction • Principle correction • Deal sub account modification • Position sub account modification 	Yes	Yes
Futures Close-Out & Option exercise/abandon	<ul style="list-style-type: none"> • Futures Close-outs • Options exercise • Options abandon 	Yes	Yes
Portability	<ul style="list-style-type: none"> • Transfer of clients: Transferring of a member client from one trading member to another • Transfer of Trading Members: Transferring of a trading member from one Clearing Member to another 	No	Yes
Margin Calculation and Balancing	<ul style="list-style-type: none"> • Variation Margin • Initial Margin: <ul style="list-style-type: none"> ○ JSPAN ○ Large Exposure Add-on ○ Liquidation Period Add-on ○ Settlement Margin ○ Additional Margin 	Yes	Yes
Other Cash Movements Balancing	<ul style="list-style-type: none"> • Funding Interest • Dividend Payments • Interest on Cash Collateral 	Yes	Yes
Collateral Management	<ul style="list-style-type: none"> • EOD Collateral (ZAR, Securities) processes • Intraday Collateral (ZAR, Securities) processes 	Yes	Yes
Fees Balancing	<ul style="list-style-type: none"> • Booking fees • Risk fees • Commissions 	Yes	Yes
Settlement Amount Balancing	<ul style="list-style-type: none"> • Balancing of daily settlement amount 	Yes	Yes
Reports (JSE produced reports)	<ul style="list-style-type: none"> • Daily Account summary reports • Daily Margin reports • Physical Delivery report • Interest Statement <p><i>NB. Clearing Members will be able to test their own reports</i></p>	Yes	Yes
EOD Re-run	<ul style="list-style-type: none"> • Simulate not reconciling or a price/other error and performing an EOD rerun after first balancing (margin & other cash) • Simulate not reconciling or a price/other error and performing an EOD rerun after second balancing (Fees & commissions) • Simulate not reconciling or a price/other error and performing an EOD rerun after EOD completed 	No	Yes
Default Management	<ul style="list-style-type: none"> • Member Client Default • Trading Member Defaults • Clearing Member Default 	No	Yes
Corporate Actions	<ul style="list-style-type: none"> • Simple Corporate Action • Complex Corporate Action 	Yes	Yes

6.1 Detailed test scenarios

Clearing Members will be required to review the 'Volume PT204a - Test scenarios for MCMT' document (provided by the JSE) that provides a detailed list of all test scenarios that will be covered during MCMT. Clearing Members will be required to confirm the MCMT testing scope as well as request any additional test scenarios that they may require. During test execution, Clearing Members will be responsible for recording all relevant testing information including test results, in the testing documentation/templates provided. This information will be used by the JSE for progress tracking and monitoring (refer to '[Progress tracking and updates](#)' section)

7 TIMELINE / TIMINGS

7.1 Overall Timeline

For overall timeline, kindly refer to JSE [presentation](#) to the Market dated 13 December 2017 (specifically slides 21 and 22),

7.2 Daily Run Schedule

The daily run schedule below provides an indicative view of a typical test execution day during MCMT. Based on the MCMT test execution schedule (to be published in due course) certain test scenarios may vary from day-to-day during the MCMT phase however the start and end times will remain predominantly the same.

Start Time	System Event	Functionality Available
Post end of previous day (19h00 to 01H00 next day)		
01h00	System offline	None
06h00	<ul style="list-style-type: none"> • RTC is available for Login • Previous day Reference Data published 	<ul style="list-style-type: none"> • Previous Reference Data downloads • Client Maintenance
Market Open (08H00 to 15H00)		
08h00	<ul style="list-style-type: none"> • Current Business Date is set • Trades from the trading system can be received by RTC • Publication of start-of-day reference prices (and every 15 minutes thereafter) 	<ul style="list-style-type: none"> • Reference Data downloads • Client Maintenance • Trade Management • Commissions Management
11h00	<ul style="list-style-type: none"> • Collateral Intra-day rebalancing • Benchmark rates published • Early valuations prices published • Intraday Margin Call (optional) 	<ul style="list-style-type: none"> • Position and risk updates • New Tradeable Instruments • Reference price publication
13h00	No more on-book trades from the trading system can be inserted, only trade (deal) management can be done	<ul style="list-style-type: none"> • Reference Data downloads • Client Maintenance • Trade Management • Commissions Management • Position and Risk Update
End of Trade Management (14h15)		
14h15	Trade Management state ends	Reference Data downloads
End-of-Day (15h30 to 19H00)		

15h30	<ul style="list-style-type: none"> • Remove pending give-up instructions • Options and future expiration • Initial and Variation Margin calculation results • CM Balancing 1 • Securities Collateral process • Fee calculations • CM Balancing 2 • Generation of payment of instructions (incl. payments from derivatives markets on legacy systems) • Member and client transfers • Corporate Actions 	<ul style="list-style-type: none"> • Client loading • Reference Data updates • Position and Risk Updates • Market data updates • Publication of account summaries • Settlement Event updates
Post End-of-Day (19h00 to 01H00)		
19h00	<ul style="list-style-type: none"> • Client Management • IDP publishes EOD reference data 	<ul style="list-style-type: none"> • Client maintenance • Reference Data downloads • EOD Reference Data available on IDP site (counterparty IDs, risk parameters and stressed prices reports)

8 TESTING PROCESS

The MCMT process will be as follows:

1. Clearing Members must each review and submit the 'Volume PT204a - Test scenarios for MCMT' document prior to commencement of MCMT. Once completed, this document will confirm the set of functions that will be supported by their clearing solution and will also serve as the testing scope that will need to be successfully executed during MCMT.
 - a. Any additional scenarios that may be required must be requested in advance and added to this test scenario document so that the JSE may prepare the required reference and transactional data (refer to '[Data Request and Preparation Process](#)' section for more details)
2. Clearing Members to independently receive and validate test execution outputs performed by the JSE as well as execute their own test scenarios independently and only contact the JSE's Clearing Test Administrator (CTA) for support or queries when required.
3. The daily intra-day and end-of-day (EoD) processes will be scheduled to start at the same time every day during MCMT, however the JSE may postpone/cancel processes on account of issues or defects picked up during testing – this call will be made as and when required and early notification to all testers will be provided.
4. All Clearing Members must aim to complete all prescribed test scenarios for a denoted cycle within the specified testing cycles.
 - a. Clearing Members who fail to complete the critical/mandatory tests within the assigned day due to issues or defects must log these with the JSE (refer to

'Defects and Query Logging Process' section) as soon as they arise, and once resolved must retest/complete the remaining test scenarios.

5. Details of the test execution outcomes must be recorded in the JSE provided documentation/templates on a daily basis and submitted weekly. This input will be used in summarising the progress achieved for that day (refer to the '[Progress Tracking and Updates](#)' section)
6. Updates to the 'Test Tracking Sheet' must be done daily. Test scenarios that were planned for execution for the day must be tagged with one of the following options:
 - **Not Run:** where a test scenario scheduled for the current day was not executed
 - **Passed:** where a scenario has met all expected results
 - **Failed:** where Clearing Members have experienced an issue and/(or) a defect has been found
 - **Blocked:** when a Clearing Member is unable to execute a test scenario due to an issue e.g. a new or existing defect that is preventing them from completing the test
 - **Not Applicable (N/A):** where a test scenario is incorrect or irrelevant to the Clearing Member's solution

9 PROGRESS TRACKING AND UPDATES

During the MCMT phase, continuous tracking of progress updates will be performed by the JSE. The role of the Clearing Member's Test Manager will be to liaise with the JSE's Clearing Test Administrator (CTA) on a daily basis and provide information on:

- testing progress,
- logging of defects (refer to '[Defect and Query Logging Process](#)' section); and
- escalation of any issues.

9.1 Daily Progress Updates

The JSE's Clearing Test Administrator (CTA) will conduct daily one-on-one calls with participants to assess the outcomes of the day's testing and assist in the management and tracking of query and issue logging and resolution:

- The progress update calls will take place during the mornings, and will cover testing progress achieved on the previous business day. This daily call will also serve as a checkpoint for the current day's testing.
- Clearing Member Test Managers must be available for the daily one-on-one update calls with the JSE as per their allotted timeslot. The update will include a log of any issues/defects reported during testing of the previous day's test scenarios, which will be distributed on the day of the call for the previous day's defects.
- In order for the issues/defect log to be accurate, all newly identified defects must be reported timeously to the JSE CSC team via telephone or email (refer to '[Defect and Query Logging Process](#)' section).

The JSE will assist participants with assessing the outcomes of the daily testing and/or assist in query resolution.

9.2 Weekly Progress Updates

A weekly group conference call will be held at the end of each testing week with all Clearing Members to provide an update on the progress achieved for the week, and to discuss common issues experienced over the course of the last five days.

The process for weekly test progress tracking will be as follows:

1. JSE will conduct a weekly group conference call at the end of each testing week, during which the JSE will provide a progress update to all MCMT participants. The JSE will send out an invite to the weekly group call for all Client Test Managers to attend.
2. Attendance is mandatory for the weekly update call, therefore the Client Test Managers must make themselves available for this call each week.
3. Feedback of overall testing progress for the week will be provided during the group call, and members will be given an opportunity to discuss general issues, concerns and possible trends etc.
4. The JSE will consolidate the individual daily test report for the week, and provide the Clearing Members with updates that will include a log of any issues / defects reported across the member group.

10 DEFECT AND QUERY LOGGING PROCESS

Clearing Members must log defects/queries as soon as they occur, and must **not** wait for the daily call before reporting. Clearing Members must log all defects/queries by phone or email with the JSE CSC team. Clearing Members must provide the JSE CSC team with the following information which will assist defining the categorisation, severity, prioritisation and analysis of the issues reported to the JSE:

1. "User ID" of the user experiencing the issue
2. Steps to recreate the issue and screenshots (where possible) must be provided – client may also include content of actual API messages where applicable
3. Relevant data used during test execution e.g. account number being used during a deal management function
4. Relevant JSE teams will validate and categorise the issue as either query or a defect
5. Severity of the defect/issue will be determined by the JSE during the logging process
6. JSE CSC team will log the issue, and supply clients with the relevant defect ID within 48 hours of the issue being reported
7. Upon receipt of the defect number Clearing Members must update the relevant test cases in their 'Volume PT204a - Test Scenarios for MCMT' document accordingly

8. JSE CSC team will assign the issue to the relevant team for assessment and resolution
 - a. If it is a query the assigned team will provide feedback via e-mail, and the query will be resolved once the client is satisfied
 - b. If upon investigation it is found that the issue is a defect, it will be prioritized and logged accordingly against the teams current workload
9. Daily progress and feedback will be given on the issue when being fixed, deployed and will only be resolved upon being tested and signed off by the client
10. Should the retest result in a failed test, the issue will be re-prioritized on and worked on until it has been resolved

NB. Clearing Members are responsible for ensuring that they receive a defect number for all issues raised during testing

11 DATA REQUEST AND PREPARATION PROCESS

As mentioned previously, Clearing Members may request additional scenarios to be executed by the JSE (i.e. on-behalf of the Clearing Member), or should a Clearing Member wish to execute specific deal management activities i.e. 'self-testing', they may add this to their request.

Where possible all scenarios must be requested prior to commencement of the phase of testing, however scenarios can be requested inflight, in which case clients must then:

1. Submit the scenario using the 'Transactional Data Request' template which will be provided to Clearing Members upon request

Note: Transactional data requests must be submitted to the JSE a minimum of two working days (before 10h00) prior to the day of expected execution
2. The JSE will assess and prepare the required data for loading into the system for test execution – depending on scenario complexity and data preparation required the JSE will confirm the required preparation time and expected day of execution
3. The JSE will update the relevant run plan with the requested scenario
4. The JSE will send out the confirmed 'Transactional Data Request' i.e. the data that has been loaded and prepared for the requested scenario a day before the expected execution
5. The Clearing Member will then use this data to execute the requested scenario

12 TEST ENVIRONMENT AND REFERENCE DATA

The JSE will be using a single test environment for the execution of VCMT and MCMT. This environment will be populated with a full set of converted production reference data, and certain attributes of this data will be aligned to the current production data. The JSE will facilitate ring-fencing of transactional and reference data as required to allow for segregation of testing during MCMT.