

## PER100 - Quality Plan

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## 1 Introduction

A key success factor for the project is that the outcome of the project meets RFO requirements and other requirements mutually agreed in the contractually binding documents including change requests. In order to be able to realise those requirements they were noted down as quality criteria during the preparation phase of the project. The quality plan is the deliverable that will list the agreed quality criteria as well as the means of assessing whether these criteria will be met. Last but not least, it will detail the approach designed and the processes followed to assure and manage the quality of the project deliverables throughout the project.

### 1.1 Purpose

This document provides:

- A description of the approach to assure RFO requirements are met
- An account of the quality expectations and objectives in the form of acceptance criteria
- An overview of the acceptance criteria / thresholds for project phases and project deliverables
- An outline of methods, processes and tools that will be applied as means to manage and assure quality

### 1.2 Intended Audience

- Project steering committee members
- Project management
- Project team members
- DBAG's contractual party, the PXs and PX project stakeholders.

### 1.3 Referenced documents

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### 3 Quality Criteria / Acceptance Criteria

#### 3.1 Bug Severity Classification

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### 3.2 Project Test Status Overview

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### 3.3 Factory Acceptance Test (FAT) Phase Metrics

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### 3.4 Integration Acceptance Test (IAT)

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### 3.5 User Acceptance Test (UAT) Phase Metrics

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### Performance test scenario for hourly instruments

This test focusses on the performance with orders entered only on hourly instruments.

The test consists of a base load period with several peaks. Between all peaks there are 5 minutes to allow the system to return back to a base load state. The total duration of the test is 60 minutes.

Phase	Transactions/second	Duration	Total transactions
Base load	8	3580 seconds	28.640
6 one-second peaks	100	1 second (6 times)	600
2 two-second peaks	100	2 seconds (2 times)	400
10 second high volume phase (plateau)	40	10	400

- Total 30.040 transactions
- Matching will take place in 6 different instruments (hours).
- 20% of trades during peak moments result from partial execution of orders
- Cross-border capacity between market areas will be unlimited so no congestion will occur during the test
- No load on block instruments is running at the same time
- Average Order book depth: 30 orders per instrument per side.
- Orders will be distributed evenly over all hubs in the used topology

The test will be conducted with 4 different topologies:

- Single hub
- 10 hubs and 10 connections
- 20 hubs and 40 connections
- 50 hubs and 150 connections



Screen refresh time for TSO Client	400	900	N/A	480	1080	N/A	640	1440	N/A	1120	2520	N/A
Screen refresh time for Explicit Access Client	400	900	N/A	480	1080	N/A	640	1440	N/A	1120	2520	N/A

Table 7: Hourly Instruments

- (1) All response times exclude network latency
- (2) All refresh times exclude network latency

### Performance test scenarios for block instruments

This test focuses on the performance with orders entered only on user defined block instruments.

The test consists of a base load period with several peaks. Between all peaks/plateaus there are 58 seconds to allow the system to return back to a base load state. The total duration of the test is 60 minutes.

Phase	Transactions/second	Duration	Total transactions
Base load	0.2	3480 seconds	696
60 two-second peaks	1	2 seconds (60 times)	120

- Total 816 transactions
- Matching will take place in a single block instrument.
- Cross-border capacity between market areas will be unlimited so no congestion will occur during the test
- No load on hourly instruments is running at the same time
- Average Order book depth: 30 orders per instrument per side.
- Orders will be distributed evenly over all hubs in the used topology

The test will be conducted, with 3 different block lengths & 4 different topologies:

#### Block lengths:

- 10 hours
- 24 hours
- 30 hours

#### Topologies:

- Single hub
- 10 hubs and 10 connections
- 20 hubs and 40 connections
- 50 hubs and 150 connections

For all topologies the following conditions apply:

Number of borders having ramping limitations: 10% of connections

Deutsche Börse AG commits to meeting the performance numbers as presented in the tables below (all response times in milliseconds):

Block Instruments (10 hours)											
	Hourly instruments (one area)		Number of hubs and connections: (This is a multiplier for the performance in %)								
(XX % of the measures should be below the mentioned value)	Standard Operation		10 hubs and 10 connections			20 hubs and 40 connections			50 hubs and 150 connections		
Response Time Indicators (1)	95%	99,50%		95%	99,50%		95%	99,50%		95%	99,50%
Order execution and trade capture response (3-4a/4b) – Indicator 1a and 1b	200	400	200%	400	800	350%	700	1400	450%	900	1800
Response time of the API	100	200	100%	100	200	100%	100	200	100%	100	200
Public Order Books Reports response (3-6)	400	800	150%	600	1200	240%	960	1920	350%	1400	2800
Refresh Time Indicators (2)	95%	99,50%		95%	99,50%		95%	99,50%		95%	99,50%
Screen refresh time for SOB-CMM Admin Client	500	1000	100%	500	1000	100%	500	1000	100%	500	1000
Screen refresh time for TSO Client	450	950	130%	585	1235	180%	810	1710	310%	1395	2945
Screen refresh time for Explicit Access Client	450	950	130%	585	1235	180%	810	1710	310%	1395	2945

Table 8: Block Instruments (10 hours)



Block Instruments (30 hours)											
	Hourly instruments (one area)		Number of hubs and connections: (This is a multiplier for the performance in %)								
(XX % of the measures should be below the mentioned value)	Standard Operation		10 hubs and 10 connections			20 hubs and 40 connections			50 hubs and 150 connections		
Response Time Indicators (1)	95%	99,50%		95%	99,50%		95%	99,50%		95%	99,50%
Order execution and trade capture response (3-4a/4b) – Indicator 1a and 1b	200	400	300%	600	1200	500%	1000	2000	600%	1200	2400
Response time of the API	100	200	100%	100	200	100%	100	200	100%	100	200
Public Order Books Reports response (3-6)	400	800	200%	800	1600	300%	1200	2400	400%	1600	3200
Refresh Time Indicators (2)	95%	99,50%		95%	99,50%		95%	99,50%		95%	99,50%
Screen refresh time for SOB-CMM Admin Client	500	1000	100%	500	1000	100%	500	1000	100%	500	1000
Screen refresh time for TSO Client	500	1000	150%	750	1500	250%	1250	2500	400%	2000	4000
Screen refresh time for Explicit Access Client	500	1000	150%	750	1500	250%	1250	2500	400%	2000	4000

Table 10: Block Instruments (30 hours)

- (1) All response times exclude network latency
- (2) All refresh times exclude network latency

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## 4 Quality Assurance Methods

### 4.1 Document Management Procedure

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### 4.2 Issue Management

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### 4.3 Change Management

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### 4.4 Test Strategy

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### 4.5 Risk Management

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