GPW WATS 1.1

BCP Tests - Guidelines for the use
of WA3 and WA2
as part of the Business Continuity Plan

LIST CONTENT

1. DISCLAIMER

This document is for informational purposes only and does not constitute any part of contractual documentation.

Reasonable care has been taken to ensure details contained within are accurate and not misleading at the time of publication. Warsaw Stock Exchange is not responsible for any errors or omissions contained in this document.

Warsaw Stock Exchange reserves the right to treat information contained in this document subject to later change without prior notice. This document contains confidential information to Warsaw Stock Exchange and may not be reproduced, disclosed, or used in whole or part, in any manner, without prior written consent from the owner of this document. Information included in this document shall be maintained and exercised with adequate security measures necessary to protect confidential information from unauthorized access or disclosure.

 Warsaw Stock Exchange will endeavor to limit changes to these sections of documents to those related to: 1. correcting errors in documentation, or; 2. clarifying the content of documentation or removing ambiguities, or 3. regulatory changes.

2. PREFACE

2.1. DOCUMENT PURPOSE

The purpose of this document is to describe activities related to switching tests of GPW Client infrastructure in the event of a malfunction of GPW WATS system modules in the WA3 data center and the need to use the WATS infrastructure in the WA2 data center.

Due to the architecture of the GPW WATS system, both data processing centers are involved in the standard operation of a trading session, but for the purposes of describing specific event scenarios, they will be referred to in the document as **PDC - Primary Data Center (WA3)** and **BDC - Backup Data Center (WA2).**

2.2. ASSOCIATED DOCUMENTS

Please check the document below to learn about the GPW WATS Trading System.

- GPW WATS 1.01 Trading System.

Please check the documentation of the transaction protocols supported by GPW WATS:

- GPW WATS 2.01 Native Order Gateway Specification
- GPW WATS 2.02 FIX Order Gateway Specification

Please check the description of communication with the Data Distribution Service:

- GPW WATS 3.01 Market Data Protocol

Please check the description of communication with IDDS:

- GPW WATS 3.02 Internet Data Distribution System
- GPW WATS 3.03 Streaming Messages for IDDS
- GPW WATS 3.04 Rest API Messages for IDDS

Please check the additional documentation describing other services provided within GPW WATS:

- GPW WATS 4.01 Drop Copy Gateway
- GPW WATS 4.02 Post Trade Gateway
- GPW WATS 5.01 Risk Management Gateway

Please refer to the additional documentation describing rejection codes, binary data format and technical description of how to join the system:

- GPW WATS 2.03 Rejection Codes
- GPW WATS 2.04 BenDec Message Definition Format
- GPW WATS 4.03 Contract Notes
- GPW WATS 6.01 Connectivity
- GPW WATS 6.02 (ENG) Short Code Record Keeping
- GPW WATS 6.02 (PL) Short Code Mapping
- GPW WATS 6.03 Short-Long Mapper User Guide.

3. DOCUMENT HISTORY

Version	Date	Description
1.0	30/08/2025	First publication of the document.
1.1.	05/09/2025	Cancelation of date in chapter 4.3.2.1

4. INTRODUCTION

4.1. GPW WATS ARCHITECTURE

GPW WATS system operates in normal operating mode using both Data Centers (WA3 and WA2), however, in normal operating mode, the main modules responsible for the construction and management of the order book (Matching Engine) are launched in the **Primary Data Center (**WA3).

Due to the above, the PDC (WA3) can be considered the primary data processing center of the GPW WATS system. Please note that during normal operating mode of the GPW WATS system, the BDC (WA2) contains active GPW WATS system modules, in particular the DDS module responsible for the distribution of market data (Stream B), so it should be treated as a full-fledged data processing center during the trading day.

4.2. EMERGENCY SCENARIOS

In accordance with the business continuity plans in force at the WSE, in particular the continuity of trading, two basic subgroups of scenarios implemented as part of the operation of GPW WATS system have been established.

For each subgroup, the scenarios are differentiated based on the timing of the event that triggers a specific scenario. In particular, the timing correlates with the current trading session phase.

Subgroup A) – scenarios addressing events, dysfunctions, failures that do not require the launch of BCP (Business Continuity Plan) scenarios and the transfer of quotations to G (WA2).

Subgroup A is a set of scenarios corresponding to situations requiring the recovery of critical business processes in High Availability (HA) mode.

Subgroup B) – Scenarios requiring the launch of the GPW WATS trading system, using only BDC (WA2) resources.

Subgroup B is a set of scenarios corresponding to situations resulting in the launch of the GPW WATS system and the recovery of critical business processes related to the operation of the GPW WATS system in Disaster mode. Recovery (DR).

IMPORTANT: The following assumptions and scenarios do not apply directly to GPW colocation clients (HFT colocation) due to the specific nature of connecting these clients directly within one Data Center.

4.3. CHARACTERISTICS OF EMERGENCY SCENARIOS

4.3.1. SUBGROUP A - (HA SCENARIOS)

This subgroup of scenarios includes all scenarios supported by GPW operational procedures describing the maintenance of critical business processes related to the GPW WATS system, which do NOT require the launch of key GPW WATS system modules (Matcher) in the BDC (WA2) centre and do NOT have to result in disruption (suspension) of the trading session.

Taking into account the redundant architecture of the GPW WATS system and the information in related documents, the system is resilient to the dysfunction of any individual GPW WATS component.

Taking the above into account, the scenarios from Subgroup A) include, among others:

S_A1 - GPW client loses single connection to GPW systems

S_A2 - unavailability of single Order Entry Gateway (OEG) FIX and BIN

S_A3 - failures of a single DDS (Data Distribution System) module

S_A4 - failures of each individual element of the GPW WATS technical network infrastructure within each of the data processing centers PDC (WA3) and BDC (WA2)).

4.3.1.1. S_A1

In accordance with GPW recommendations, each client connected to the GPW WATS system uses a redundant connection to both GPW data processing centers (PDC (WA3) and BDC (WA2)).

Access to the Order Entry Gateway (OEG) at both centers is available via any of the established connections. Traffic prioritization mechanisms allow the connected client to configure their access infrastructure to guarantee access to the GPW WATS system in the event of a single operator/link failure.

4.3.1.2. S_A2

Failure of a single OEG requires switching the client to an alternative OEG whose client access parameterization is consistent with the one normally used in the absence of incidents.

The switchover is only possible with the agreement and under the operational supervision of the WSE and requires action by the GPW WATS System Operation Team (OEG activation).

The OEG to which the client sessions are switched has an address from BDC (WA2) in accordance with the Connectivity document.

Details about switching within the protocol, BIN and FIX, respectively, are described in the associated documentation.

4.3.1.3. S_A3

Failure of a single DDS module, regardless of whether it is in PDC (WA2) or WA3 (BDC), will result in the distribution of market data from GPW WATS exclusively from one of the processing centers until the end of the session.

In such a case, arbitration mechanisms that involve comparing data in streams transmitted simultaneously from PDC (WA2) and BDC (WA3) will not be applicable, and message losses and ongoing market data processing must then be based solely on the Replay mechanism and Snapshot of a single stream.

4.3.1.4. S_A4

All elements of the network infrastructure within GPW WATS are configured redundantly, both within the internal GPW WATS network and access segments for GPW WATS system clients.

The mechanisms of traffic engineering and reliable switching in the event of failure of individual links/ports/inserts are based on the current recommendations of network equipment suppliers and correspond to the current standards of designing the architecture of telecommunication networks.

4.3.2. SUBGROUP B - (DR SCENARIOS)

The scenarios in this group address the situation in which IT resources supporting the handling of key processes within the GPW WATS system are unavailable and an operational transfer of key GPW WATS system modules to resources in BDC (WA2) is required.

In accordance with applicable regulations, the process of launching key GPW WATS services in BDC (WA2) should be completed within 2 hours.

Detailed operational activities for each moment of the occurrence of an incident requiring the activation of the Subgroup B scenario, with particular emphasis on the current state of the GPW WATS system and the trading session phase in the common part, assume:

1. Reliability and accountability of a continued or settled trading session (depending on the time of the incident), based on data available only in the currently available BDC (WA2).

2. The need to use technical connections and client access configuration to WATS interfaces available in such a case only within BDC.

3. Using only a single market data stream (Stream B) from BDC (WA2).

4. The ability of client applications to continue the current trading session after a break and technical switchover to the GPW WATS system interfaces located in BDC (WA2).
   The status of interfaces in BDC (WA2) corresponds to the current state of the trading session and the client's ability to continue the session depends on determining the current state of its systems in accordance with the data available in the GPW WATS system running in BDC (WA2). (see related GPW WATS documentation: FIX/BIN port, DDS).

The moments that determine the implementation of a specific scenario are the key events of the trading session resulting from the quotation schedule:

S_B1 – incident/failure before the first transaction

S_B2 – incident/failure after the first transaction and up to two hours before the end of trading in the current trading session

IMPORTANT: Depending on current factors, with particular emphasis on the state of the market and the time remaining until the close of trading on the day of the incident, with the option of extending the session schedule and extending the trading session, the session on a given day may be <u>continued </u>and settled with BDC or only settled with BDC.

S_B1

The failure and the decision to transfer quotations to BDC (WA2) occurs before the first transaction is concluded in a given session in the GPW WATS system.

In accordance with the adopted assumptions and within operational possibilities, GPW will modify the session schedule so that no transaction is concluded in PDC (WA2), and the session will be continued after the GPW WATS system is launched in BDC (WA2).

4.3.2.1. S_B2

The failure and the decision to transfer quotations to BDC (WA2) occurs after the first transaction is concluded in the current session in the WATS system.

Dress Rehearsal. Rehearsal test

The continuation and settlement of the session or only the settlement of the session will take place on the basis of the current data in BDC (WA2) in accordance with the scenario presented in the document:

GPW WATS 1.0 - Dress Rehearsal – General test

4.4. COMMUNICATION WITH GPW CLIENTS

Activation of any scenario from Subgroup B results in communication to all market participants in accordance with the operational procedures for the trading system applicable on the WSE.

Scenarios from Subgroup A, depending on the impact and potential consequences, based on the current assessment of the situation, will be handled in accordance with the internal procedures of GPW in communication with the clients they concern