SERVICE AND TECHNICAL DESCRIPTION

# Oslo Børs cash equity and fixed income market migration to TradElect

# Important note

This Service and Technical Description sets out the current position regarding the Oslo Børs cash equities and fixed income market migration to TradElect in partnership with the London Stock Exchange Group, "the Group", and, as a development project, is subject to change.

This document has been produced by the Group and Oslo Børs to assist customers of these Oslo Børs markets. While it has been prepared on the basis of the best information available, Oslo Børs and the Group accepts no liability for decisions taken, or systems work carried out by any party, based on this document.

This document does not form part of the contractual documentation between the Oslo Børs and its respective customers.

If you have any general queries relating to this document, please email: technicalsupport@oslobors.no

Further copies of this document can also be downloaded from both the Oslo Børs and the Group website at the following links:

http://www.oslobors.no/ob_eng/Oslo-Boers/Trade/Delta

http://www.londonstockexchange.com/techlib

**Contents**

This document, “Oslo Børs cash equity and fixed income market migration to TradElect Service and Technical Description”, has been through the following iterations:

| Version | Date | Description |
|---|---|---|
| 1.0 | August 2009 | Initial document release |
| 2.0 | October 2009 | Updated release |
| 3.0 | January 2010 | Updated release |
| 3.1 | 13 January 2010 | Minor update to version 3.0 |
| 4.0 | February 2010 | Updated release |

Amendments made to the original content, will be identified using a series of side bars as illustrated opposite.

The following schedule of changes also provides further details of amendments to the original document.

| # | Section | Page # | Description |
|---|---|---|---|
| 1 | 1.1 | 7 | 4th bullet changed to: "Named orders including Iceberg orders (fixed income only)" from: "Named Iceberg orders (fixed income only)" and new bullet added: "New Tradable Instrument Types and Manual Trade Types (equities and fixed income)" |
| 2 | 4.3 | 15 | Re-worded to say that for certain fixed income Segments only certain manual trade types will be considered for high low updates |
| 3 | 4.3 | 16 | For the 5LL message, the format of the Time of Last Trade Price field changed to N |
| 4 | 4.4 | 17 | Title of section changed to: "4.4 Named orders including Iceberg orders (fixed income only)" from: "4.4 Named Iceberg orders (fixed income only)" |
| 5 | 4.5 | 17 | Re-worded to say that counterparty details will included for equity trades only and settlement details will be included for fixed income trades only. Also a new paragraph has been added to this section detailing the fact that multiple 5OZ uncrossing trade messages will be generated for Oslo markets rather than a single consolidated 5OZ message |
| 6 | 4.6 | 19 | A precision of 8 added to wording for Yield field |
| 7 | 4.6 | 21 | For the 5UD message, the offset for the two last fields has been updated. The offset for Mid Yield changed to 199 and the offset for Uncrossing Yield changed to 218. The message length has also been changed to 237 bytes |

| | | | |
|---|---|---|---|
| 8 | 4.7 | 22 | Re-worded to include detail on multiple trade types being used for Repo trades (previously it was suggested that a single trade type was to be used) |
| 9 | 4.8 | 23 | New message content table showing a correct message length of 402 bytes (previous document showed an incorrect message length of 400 bytes) |
| 10 | NEW | 27 | New 4.11 section added for Oslo Tradable Instrument Types and Manual Trade Types |
| 11 | 4.12.1 | 29 | Removed 5TH message from Oslo Equity Level 1 G01 Service Channel |
| 12 | 4.12.4 | 32 | Removed 5TH message from Oslo Fixed Income Level 1 G04 Service Channel |
| 13 | 4.12.7 | 35 | Removed 5TH message from Oslo Warrants Level 1 G07 Service Channel |
| 14 | Appendix B | 46 | Trade Type per Segment table added |
| 15 | 2.1 | 9 | Confirmed that the third dress rehearsal on Saturday 30 January is now mandatory |
| 16 | 4.9 | 26 | Changed length of ‘Country of Primary Listing’ field in 5NC message to 4 bytes |
| 17 | 4.9 | 27 | Included descriptions for 5ON (AB) and 5OU (AB) messages |
| 18 | 4.12.4 | 32 | Removed 5SK (Opening Price) and 5PR (Closing Price) messages from Service Channel G04 |
| 19 | Appendix A | 45 | Removed 5SK AB message version as this will not be used |
| 20 | 2.1 | 9 | Updated key milestones to reflect revised project timetable |
| 21 | 6 | 44 | Updated with revised go live date |

# 1. Introduction

As part of their commitment to providing world-leading execution services Oslo Børs has formed a strategic partnership with the Group.  This will see the migration of the cash equities and fixed income markets to the *TradElect* platform with *Infolect* used for market data distribution. The derivatives market will migrate to the *SOLA* trading and information platform.

This strategic partnership agreement will allow both exchanges to co-operate across their equities, fixed income and derivatives markets with a view to improving market efficiency and liquidity.

This document covers the migration of the Oslo Børs cash equities and fixed income markets to TradElect which is due to complete in the first quarter of 2010.

The other key phases for this strategic partnership include:

- The Oslo derivatives market will migrate on to the derivatives trading platform *SOLA*, which is the Group's chosen technology provided by TMX Group.  This migration was completed in November 2009.
- The Group and Oslo Børs will work closely on market surveillance, including related technological co-operation;
- The two companies also anticipate co-operation in areas such as regulatory policy, operational regulatory processes and the sharing of market information for regulatory purposes.

## 1.1 Scope of Changes

This document covers the changes to the existing *TradElect* platform and *Infolect* system functionality.

The scope of these changes covers the following areas:

- Own Order Preferencing (equities and fixed income);
- Dynamic Pro Rata Reallocation (fixed income only);

- New **5LL** 'Trade High Low Last' message and VWAP processing (equities and fixed income);
- Named orders including Iceberg orders (fixed income only);
- New **5OZ** 'Trade Report' message (equities and fixed income);
- Bond calculations (fixed income only);
- Bond Repurchase (Repo) Agreements (fixed income only);
- News and Index messages (*Infolect*);
- New **5BN** 'Broadcast Notification' message;
- New Tradable Instrument Types and Manual Trade Types (equities and fixed income).

This document does not cover the Oslo Derivatives market migration to SOLA. Further information on that migration can be found at the following link:

http://www.londonstockexchange.com/edx/edx-roadmap/edx-roadmap.htm

## 1.2 Readership

When read in conjunction with Fix 5.0 Guide, this Service and Technical Description outlines all of the details Oslo customers should need to know in order to migrate the cash equities and fixed income markets to *TradElect*. This includes changes to existing functionality required to enable these markets to operate on the *TradElect* platform, including:

- an overview of the market model for both cash equities and fixed income;
- a technical description of the functional changes including both trading and broadcast messages;
- migration approach and testing.

This document is particularly relevant to trading and technical staff at Oslo Børs member firms and other market participants interested in trading on its markets.

## 1.3 Other Relevant documentation

Current technical specifications for *TradElect* and *Infolect* can be found via both the Oslo Børs and the Group website at the links below:

http://www.oslobors.no/ob_eng/Oslo-Boers/Trade/Delta

http://www.londonstockexchange.com/techlib

## 1.4 Enquiries and Comments

Technical support related to this migration is available from 08:00-16:00 CET:

Phone: +47 2234 1818
Email: technicalsupport@oslobors.no

# 2. Project Implementation

## 2.1. Key Milestones

The key milestones for the project with indicative dates are shown below. The launch of the Oslo Børs cash equities and fixed income markets on *TradElect* is planned for Q1 2010.

| Timetable | |
|---|---|
| **17 August 2009** | Oslo Børs Service and Technical Description issued (this document) |
| **7 September 2009** | Customer Testing Guide issued |
| **7 September 2009** | Customer Testing Service go-live with Oslo Børs market models (CDS and FIX5.0 online conformance test tool) |
| **16 September 2009** | Conformance Testing Service go live |
| **26 October 2009** | Updated Oslo Børs Service and Technical Description and Market Configuration Matrix issued (version 2) |
| **30 November 2009** | Dress Rehearsal Guide issued |
| **12 December 2009** | First mandatory weekend dress rehearsal (all conformance testing completed by this date) |
| **16 January 2010** | Second mandatory weekend dress rehearsal |
| **27 February 2010** | Third mandatory weekend dress rehearsal |
| **27 March 2010** | Fourth weekend dress rehearsal (optional) |
| **12 April 2010** | Go Live |

# 3. Service Overview

Please find detailed below brief highlights on the changes in market model and functionality when the Oslo Børs markets migrate to *TradElect*.

**Cash equities**

- Oslo Børs will harmonise with the Group's market model where possible;
- Existing products on Oslo Børs and Oslo Axess will be supported;
- Opening and closing auctions will differ from the methods used in the Oslo equities market today;
- A Lot size of 1 will become standard;
- Members who do not currently use *TradElect* will have to adapt their trading and information interface and front office solutions.

**Fixed income**

- Existing products on Oslo Børs and Oslo ABM will be supported;
- Changes to the current Oslo Børs market model will be necessary;
- The Saxess trade terminal will have to be replaced;
- Members using other front end solutions will have to adapt these solutions.

Full details regarding the market models for both the Oslo Børs cash equities and fixed income markets are available on the Oslo Børs website at:

www.obvps.no/obvps_eng/Frontpage/Delta/Market-model

Please note that the documents describing the market models set out the current position regarding the Oslo Børs cash equities and fixed income market migration to TradElect, and as a development project, are subject to change.

# 4. Technical Changes

This section outlines the technical changes that have been made to the Group's *TradElect* trading platform and *Infolect* market data dissemination system to support the introduction of the Oslo Børs cash equities and fixed income markets.

This has led to the introduction of some new broadcast message types and message versions, details of which can be found in this section.

*TradElect's* proprietary fixed-width ("native") and FIX 5.0 interfaces will support Oslo Børs cash equities market. However, Oslo customers wishing to access the Oslo Børs fixed income market will need to develop to the FIX 5.0 interface. <u>*TradElect's* native interface will not support the Oslo Børs fixed income market.</u>

### 4.1 Own Order Preferencing (equities and fixed income)

Oslo Børs offer its members the option to preferentially trade with themselves before trading with other participants where there is more than one order at a given price level. *TradElect* has been enhanced to preference orders associated with the same group of Trader Groups (associated with the participant's Member ID) over other orders at the same price.

This means that orders submitted by a Trader Group(s) configured to use Own Order Preferencing will execute in the following sequence:

- **Price** (best price executes first);
- **Other orders for the same Trader Group(s)** (includes visible and hidden orders of any age at the current price level);
- **Type** (visible orders before hidden orders);
- **Time** (oldest orders execute first).

With Own Order Preference applied, orders associated with the same group of Trader Groups will execute by type (visible orders before hidden orders) followed by time priority (oldest orders first).

For example:

| | Trader Groups - Buy | Buy | Price | Sell | Trader Groups - Sell |
|---|---|---|---|---|---|
| | | | 102 | | |
| Order Entered → | 1 | 1000 | 101 | 400 | 1 |
| | | | 101 | 100 | 1 |
| | | | 101 | 500 | 4 |
| | | | 101 | 100 | 2 |
| | | | 100 | 100 | 3 |
| | | | 100 | 100 | 1 |
| | | | 99 | 100 | 1 |
| | | | 99 | 100 | 2 |

Fig 1. Order book for segment configured for Own Order Preferencing

- Trader Group 1 enters a buy order at price 101 for qty 1000;
- The orders on the sell side of the order book will be executed against in price priority first;
- All of the sell orders at price levels 99 and 100 can be satisfied so no Own Order Preferencing is necessary at these levels;
- The sell orders at price level 101 can not all be satisfied therefore Own Order Preferencing is necessary at this price level;
- There are 2 orders that have been entered by Trader Group 1 and they are therefore considered for execution before the other orders.

The following trades would be generated from this execution:

| Trade | Price | Volume | Trader Group - Sell |
|---|---|---|---|
| Trade 1 | 99 | 100 | 1 |
| Trade 2 | 99 | 100 | 2 |
| Trade 3 | 100 | 100 | 1 |
| Trade 4 | 100 | 100 | 3 |
| Trade 5 | 101 | 400 | 1 |
| Trade 6 | 101 | 100 | 1 |
| Trade 7 | 101 | 100 | 4 |
| Total | | 1000 | |

Fig 2. Trades generated from execution with Own Order Preferencing applied

Own Order Preferencing will initially be enabled on all segments for the Oslo Børs equities market and those segments for the fixed income market that support automatic execution. Own Order Preferencing is not applicable to segments where there is no automatic execution.

By default all Oslo Børs customers' trader groups (associated with the same Member ID) will be configured to use this functionality. However, members can choose to opt out one or more trader groups from Own Order Preferencing.

Own Order Preferencing will also be used to determine the order of execution in an auction uncrossing.

No messages will be disseminated either via broadcast, or interactively for orders that may have been internally re-ordered as a result of Own Order Preferencing and that remain un-executed on the order book.

Messages will only be sent for orders that are involved in execution, or where a message would otherwise have been sent (e.g. entry, injection, modification, deletion, etc.).

### 4.2 Dynamic Pro rata Reallocation (fixed income only)

During an issuing auction for the Oslo Børs fixed income market, *TradElect* will identify the side of the book with excess volume (buy or sell) that is eligible to execute. Orders on the excess side of the book, at the lowest priority price level that executes, will be prorated so that they will all share in the execution. All other executable orders outside the lowest priority price level on the excess side of the book will be executed as normal in price type time priority. This is known as "Dynamic Pro Rata Reallocation" functionality.

For example:

Uncrossing price = 6
Side of book with excess volume at uncrossing price (1000>300) = Buy
Lowest priority price level = 6
Lot size = 10

| | Buy | Price | Sell |
|---|---|---|---|
| | | 10 | 200 |
| | 100 | 9 | |
| | | 8 | |
| | | 7 | |
| | 150 | 6 | 300 |
| | 200 | 6 | |
| | 250 | 6 | |
| | 300 | 6 | |
| | 100 | 5 | |
| **Total** | **1100** | | **500** |

Orders unable to execute at Uncrossing price

Fig 3. Order book pre-reallocation

The new order size of order to be executed = existing order size / (total volume of excess side at lowest priority price level / total remaining volume of non-excess side)

In the above example:
Total volume of excess side at lowest priority price level / total remaining volume of non excess side = 900 / 200

The new order size must be a multiple of Lot size. If the volume is not equally divisible, any remainder (identified as the sum of the total remainder resulting from rounding down each order size to the nearest lot size integer) is allocated lot size by lot size on a priority basis. For example, if there is a volume of 40 remaining and the Lot size is 10, the top 4 orders will be allocated one each. Orders are prioritised in price, type, time priority:

- **Price** (best price executes first);
- **Type** (visible orders before hidden orders);
- **Time** (oldest orders execute first).

Number of orders to receive remainder = volume remaining / Lot size.

Any volumes that will not be involved in the uncrossing execution are not shown here:

| | Buy | Price | Sell |
|---|---|---|---|
| | | 10 | |
| | 100 | 9 | |
| | | 8 | |
| | | 7 | |
| | 40 | 6 | 300 |
| | 50 | 6 | |
| | 50 | 6 | |
| | 60 | 6 | |
| | | 5 | |
| **Total** | **300** | | **300** |

Fig. 4 Order Book to illustrate volumes that will execute

The order book below illustrates the volumes of orders that will remain on the order book after Uncrossing and Reallocation has taken place

| | Buy | Price | Sell |
|---|---|---|---|
| | | 10 | 200 |
| | | 9 | |
| | | 8 | |
| | | 7 | |
| | 110 | 6 | |
| | 150 | 6 | |
| | 200 | 6 | |
| | 240 | 6 | |
| | 100 | 5 | |
| **Total** | **800** | | **200** |

Fig 5. Post-Reallocation order book

## 4.3 5LL 'Trade High Low Last' message and VWAP processing (equities and fixed income)

A new **5LL** 'Trade High Low Last' message (version AA) will be introduced. Only automatic trade types will be considered for equities trades. For fixed income trades, certain manual and automatic trade types will be considered for certain Segments.

| Field Name | Offset | Length | Format |
|---|---|---|---|
| Tradable Instrument Code | 37 | 12 | A |
| Country of Register | 49 | 2 | A |
| Segment Code | 51 | 4 | A |
| Currency Code | 55 | 3 | A |
| Trade High | 58 | 18 | N |
| Trade High Yield | 76 | 19 | S |
| Trade Low | 95 | 18 | N |

| | | | |
|---|---|---|---|
| Trade Low Yield | 113 | 19 | S |
| Last Trade Price | 132 | 18 | N |
| Last Trade Yield | 150 | 19 | S |
| Trade Date | 169 | 8 | N |
| Time of Trade High | 177 | 6 | N |
| Time of Trade Low | 183 | 6 | N |
| Time of Last Trade Price | 189 | 6 | N |
| Broadcast Update Action | 195 | 1 | A |
| **Total Length** | **196 bytes** | | |

Fig 6. **5LL** (AA) 'Trade high Low Last' message

A **5LL** 'Trade High Low Last' message will be disseminated in the event of any of the following:

- The first trade of the day;
- If a trade price is greater than the current trade high price and a new trade high has been generated;
- If a trade price is less than the current trade low price and a new trade low has been generated;
- If a trade price is greater than or less than the current last trade price but does not create a new trade high or trade low, (a new last trade price will be generated).

If there is no change in the trade high, trade low or last trade price no new message will be sent. If no trades are executed for a security, no **5LL** 'Trade High Low Last' messages will be generated.

If the trade yield has not been calculated the *Trade Yield* field in the **5LL** 'Trade High Low Last' message will remain blank.

It is possible for current day contra or cancelled trades to result in updated **5LL** 'Trade High Low Last' messages being sent out from *Infolect*. Any **5LL** 'Trade High Low Last' messages which are sent out as a result of contra or cancelled trades will have the *Broadcast Update Action* set to 'C'.

*Infolect* has been further enhanced to generate combined **5VW** 'Volume Weighted Average Price' (VWAP) messages for Segments which have been configured for this purpose. These messages will take both Automatic and Manual Trades into consideration and will be published once at the end of each day. Please note that no changes to the layout of the current version (AA) of this message have been required.

A VWAP Price = Cumulative Price Quantity / Cumulative Quantity

Where Cumulative Price Quantity = the sum of trade price * trade size for all eligible trades
Where Cumulative Quantity = the sum of trade size for all eligible trades.

Only trades that have occurred where trade date = current date (including delayed trade reports) will be included in the Trade High Low Last and VWAP calculations. This specifically excludes previous day, early morning and delayed trade reports which have not yet been published.

Please note the following Segments will disseminate 5VW and 5LL messages intraday: OBX, OBMA, OBPC, OAX, OBWR, OBFU, OBAU, OBOC, OABM. The following Segments will disseminate 5VW and 5LL messages at the end of the day: OBTM and OABT. The following Segments will not disseminate 5VW and 5LL messages: OBIA, OBBA and OBUB.

### 4.4 Named orders including Iceberg orders (fixed income only)

The Oslo Børs fixed income market uses Named Iceberg orders and as a result *TradElect* will offer this functionality.

When an order is entered for an instrument that is in a Segment that has been configured to publish participant details on order details the 5OO 'Order details' message will be broadcast with the *Member ID* field populated. Members should be aware that in addition to iceberg orders, this functionality applies to all other order market mechanism types, i.e. Limit orders, Market orders, and Committed Principal Orders.

### 4.5 5OZ 'Trade Report' message (equities and fixed income)

A new version (AC) of the **5OZ** 'Trade Report' message, containing the counterparty details (equities only) and the settlement details (fixed income only) of the trade will be introduced. It will contain 5 new fields: *Counterparty Buy, Counterparty Sell, Settlement Date 1, Settlement Date 2 and Yield.*

For equities trades, the fields Counterparty Buy and Counterparty Sell will be filled in for all trades.

For fixed income trades, the *Yield* field will only be populated when it is used for reporting Fixed Rate Bullet Bond trades. *Settlement Date 1* will be populated with the Settlement Due Date of the trade (manual trades only) and *Settlement Date 2* will only be populated for Repurchase Agreements (Repos).

| Field Name | Offset | Length | Format |
|---|---|---|---|
| Market Segment Code | 37 | 4 | A |
| Tradable Instrument Code | 41 | 12 | A |
| Country of Register | 53 | 2 | A |
| Currency Code | 55 | 3 | A |
| Trade Code | 58 | 10 | A |
| Trade Price | 68 | 18 | N |
| Trade Size | 86 | 13 | S |
| Execution Venue | 99 | 11 | A |
| **Counterparty Buy** | **110** | **11** | **A** |
| Trade Date | 121 | 8 | N |
| Trade Time | 129 | 6 | N |
| Trade Type Indicator | 135 | 2 | A |
| Bargain Condition Indicator | 137 | 1 | A |
| Trade Time Indicator | 138 | 1 | A |
| Converted Price Indicator | 139 | 1 | A |
| **Counterparty Sell** | **140** | **11** | **A** |
| **Yield** | **151** | **19** | **S** |
| **Settlement Date 1** | **170** | **8** | **N** |
| **Settlement Date 2** | **178** | **8** | **N** |
| Broadcast Update Action | 186 | 1 | A |
| **Total Length** | **187 bytes** | | |

Fig 7. **5OZ** (AC) 'Trade Report' message

For uncrossing trades, a **5OZ** 'Trade Report' message will be produced for each individual execution that occurs during an uncrossing. This is different to other markets (e.g. London) where a single **5OZ** message is generated at the end of uncrossing to provide a cumulative representation of the trades that occurred during that uncrossing.

## 4.6 Bond calculation (fixed income only)

*TradElect's* fixed income capability has been extended to accommodate the requirements of the Oslo Børs fixed income market. This includes:

- Yield will be calculated for fixed income instruments when a priced order or trade is entered into the system;

- As the yield is based on the current business date, it will change on a daily basis. Therefore the calculated yield will be re-calculated at start of day. Yield will not be calculated for Repo trades.

- A Yield field has been introduced to a number of *Infolect* broadcast messages. This Yield field will have a precision of 8:

| Field Name | Offset | Length | Format |
|---|---|---|---|
| Yield | - | 19 | S |

Fig 8. New Yield field

- This new Yield field will be published on new versions of the following existing broadcast messages:

    - **5OO** (AD) 'Order Details'

| Field Name | Offset | Length | Format |
|---|---|---|---|
| Market Segment Code | 37 | 4 | A |
| Market Sector Code | 41 | 4 | A |
| Tradable Instrument Code | 45 | 12 | A |
| Country of Register | 57 | 2 | A |
| Currency Code | 59 | 3 | A |
| Participant Code | 62 | 11 | A |
| Buy/Sell Indicator | 73 | 1 | A |
| Market Mechanism Group | 74 | 1 | A |

| | | | |
|---|---|---|---|
| Order Code | 75 | 10 | A |
| Market Mechanism Type | 85 | 2 | A |
| Order Price | 87 | 18 | N |
| Aggregate Size | 105 | 12 | N |
| Dealing Capacity | 117 | 1 | A |
| Time Validity | 118 | 4 | N |
| Date Validity | 122 | 8 | N |
| Personal Exposure Information | 130 | 9 | A |
| Participant Order Reference | 139 | 10 | A |
| Client Reference | 149 | 15 | A |
| Single Fill Indicator | 164 | 1 | A |
| **Yield** | **165** | **19** | **S** |
| Broadcast Update Action | 184 | 1 | A |
| **Total Length** | **185 bytes** | | |

Fig 9. 5OO (AD) 'Order Details'

- **5OZ** (AC) 'Trade Report' (Fig. 7, pg 18)
- **5SF** (AB) 'Best Price and Volume'

| Field Name | Offset | Length | Format |
|---|---|---|---|
| Tradable Instrument Code | 37 | 12 | A |
| Country of Register | 49 | 2 | A |
| Market Segment Code | 51 | 4 | A |
| Currency Code | 55 | 3 | A |
| Market Sector Code | 58 | 4 | A |
| Volume of Orders at Best Bid Price | 62 | 12 | N |
| Volume of Orders at Best Offer Price | 74 | 12 | N |
| Number of Orders at Best Bid Price | 86 | 3 | N |
| Number of Orders at Best Offer Price | 89 | 3 | N |

| | | | |
|---|---|---|---|
| Bid Market Orders Indicator | 92 | 1 | A |
| Offer Market Orders Indicator | 93 | 1 | A |
| Best Bid Price | 94 | 18 | N |
| Best Offer Price | 112 | 18 | N |
| Mid Price | 130 | 18 | N |
| Best Price Status Indicator | 148 | 1 | A |
| Date Of Preparation | 149 | 8 | N |
| Time Of Preparation | 157 | 6 | N |
| **Bid Yield** | **163** | **19** | **S** |
| **Offer Yield** | **182** | **19** | **S** |
| **Mid Yield** | **201** | **19** | **S** |
| **Total Length** | **220 bytes** | | |

Fig 10. 5SF (AB) 'Best Price and Volume'

- **5UD** (AB) 'Uncrossing Price and Volume'

| Field Name | Offset | Length | Format |
|---|---|---|---|
| Tradable Instrument Code | 37 | 12 | A |
| Country of Register | 49 | 2 | A |
| Market Segment Code | 51 | 4 | A |
| Currency Code | 55 | 3 | A |
| Market Sector Code | 58 | 4 | A |
| Best Bid Price | 62 | 18 | N |
| Best Offer Price | 80 | 18 | N |
| Mid Price | 98 | 18 | N |
| Uncrossing Price | 116 | 18 | N |
| Uncrossing Volume | 134 | 12 | N |
| Uncrossing Price Status Indicator | 146 | 1 | A |
| Date Of Preparation | 147 | 8 | N |
| Time Of Preparation | 155 | 6 | N |
| **Bid Yield** | **161** | **19** | **S** |
| **Offer Yield** | **180** | **19** | **S** |

| | | | |
|---|---|---|---|
| Mid Yield | 199 | 19 | S |
| Uncrossing Yield | 218 | 19 | S |
| **Total Length** | **237 bytes** | | |

Fig 11. 5UD (AB) 'Uncrossing Price and Volume'

Please note that the above new message versions will be used for both the equity and fixed income markets. The Yield field will not be populated for messages disseminated on equity market Service Channels.

- Yield will be published on the following new broadcast message:
  - **5LL** (AA) 'Trade High Low Last' (Fig. 6, pg 15)

- Yield (236) will also be published on the following interactive FIX messages:
  - ExecutionReport (MsgType=8). This message also contains FillYield (1623) in <FillsGrp> for each fill within an execution report.
  - TradeCaptureReportAck (MsgType=AR)
  - MassQuoteAcknowledgement (MsgType=b)

- Yield will also be sent on the FIX Own Order Book and Own Trades Book downloads;

## 4.7 Bond Repurchase (Repo) Agreements (fixed income only)

*TradElect* has been updated to allow Repurchase Agreements (Repos) to be manually reported. Inbound trade reports will support Repo trade types and an additional settlement date. This enables two settlement dates to be reported, one for each leg of the Repo. Each Repo contract will receive one trade code.

*TradElect* has been enhanced to allow Repurchase Agreements to be reported through the FIX5.0 interface but not the native (fixed width) interface.

A Repo manual trade can be reported using the FIX message - TradeCaptureReport (MsgType=AE).
The TrdSubType field (829) will be updated to support the additional values. StartDate (916) and EndDate (917) will be used for the two Settlement Due dates.

Two new trade types will be created to support Repo trades. The new trade types will also be sent on the following *Infolect* broadcast messages which contain the *Trade Type Indicator* field:

- **5TY** (AA) 'Trade Type for Segment'
- **5OZ** (AC) 'Public Trade Report'

For the Repo trade types, validation has been introduced to ensure the fields are populated and are in the correct format and that Settlement Date 2 is on or after Settlement Date 1.

When an inbound Repo trade has passed through the FIX5.0 *TradElect* interface, the following validation checks will be performed for the settlement dates supplied:

- Both settlement dates need to be provided (no blanks). If the message fails this validation a new Application Advisory Code **(Q525I)** will be returned specifying – "Settlement Due Date Missing" and no further processing will take place.
- If it is not a Repo trade type, Settlement Date 1 should be populated as normal <u>and</u> Settlement Date 2 should be blank. If either field fails this validation the existing Application Advisory Code **(Q331I)** will be returned specifying – "Settlement Due Date Invalid" and no further processing will take place.

- For Repos, Settlement Date 2 needs to be equal to or after Settlement Date 1. If the message fails this validation a new Application Advisory Code **(Q524I)** will be returned specifying – "End Date is less than Start Date" and no further processing will take place.

**Note**: The (fixed width) native interface does not support the Repo trade types for inbound messages.

### 4.8 Fixed Income Reference Data (fixed income only)

A new **5FI** (AA) 'Fixed Income Reference Data' message (replaces **5ER** 'Equity Background Data message') will be introduced for the fixed income market. The message contents will be as follows:

| Field Name | Offset | Length | Format |
|---|---|---|---|
| Tradable Instrument Code | 37 | 12 | A |
| Country Of Register | 49 | 2 | A |
| Segment Code | 51 | 4 | A |
| Currency Code | 55 | 3 | A |
| Issuer Code | 58 | 6 | A |
| Tradable Instrument Type | 64 | 2 | A |
| Tradable Instrument Short Name | 66 | 15 | A |
| Tradable Instrument Name | 81 | 40 | A |
| SEDOL Code | 121 | 7 | A |
| Default Currency | 128 | 3 | A |
| Bid Status | 131 | 1 | A |
| Standard Market Size | 132 | 10 | N |
| Normal Market Size | 142 | 10 | N |
| DOL Classification Group | 152 | 3 | A |
| DOL Indicator | 155 | 1 | A |
| DOL Spread | 156 | 12 | N |
| DOL Section Number | 168 | 4 | A |
| DOL Spread Change Date | 172 | 8 | N |
| Industry Sector Code | 180 | 2 | A |
| Local Market TIDM | 182 | 6 | A |
| Tradable Instr Symbol Code Group A | 188 | 36 | A |
| Tradable Instr Symbol Code Group B | 224 | 3 | A |
| Unit Of Quotation | 227 | 10 | N |
| Asset Class | 237 | 1 | A |
| Country Of Register Status | 238 | 1 | A |
| Number Of Units Issued | 239 | 15 | N |
| Issuer Name | 254 | 35 | A |
| Expected LM Date Interim Results | 289 | 8 | N |
| Expected LM Date Final Results | 297 | 8 | N |
| Profit After Tax | 305 | 16 | S |
| Company Turnover | 321 | 15 | N |
| Coupon Rate | 336 | 5 | N |
| Maturity LM Date | 341 | 8 | N |
| **Coupon Frequency** | 349 | **3** | **A** |
| Bond Par Value | 352 | 18 | N |
| Fixed Income Security Type | 370 | 1 | A |

| | | | |
|---|---|---|---|
| Issue Date | 371 | 8 | N |
| Valuation Day Count Convention | 379 | 1 | A |
| Valuation Business Day Convention | 380 | 1 | A |
| Accrued Interest Day Count Convention | 381 | 1 | A |
| Accrued Interest Start Date | 382 | 8 | N |
| **ExCoupon Period** | 390 | **3** | **N** |
| First Coupon Date | 393 | 8 | N |
| Broadcast Update Action | 401 | 1 | A |
| **Total Length** | **402 bytes** | | |

Fig 12. New **5FI** (AA) 'Fixed Income Reference Data' message

## 4.9 News and Index messages (*Infolect*)

News and Index messages for the Oslo Børs market will be disseminated via *Infolect*. The existing **5OU (AB)** 'Index Value', **5ON (AB)** 'Index Status' messages will be used, whilst new versions of the **5NC** 'News Control' (AC) and **5NT** (AB) 'News Text' messages are required to allow additional fields to be reported.
In addition, the length of existing fields Announcement Number and Company Description contained within the **5NC** message has been enlarged.

**Note:** The new fields highlighted in red.

| Field Name | Offset | Length | Format |
|---|---|---|---|
| **Announcement Number** | **37** | **10** | **A** |
| Announcement Date of Release | 47 | 8 | N |
| Announcement Time of Release | 55 | 6 | N |
| Announcement Correction Code | 61 | 1 | A |
| **Previous Announcement Number** | **62** | **10** | **A** |
| Announcement Standby Code | 72 | 1 | A |
| Number Associated Text Records | 73 | 4 | N |
| **Announcement Headline** | **77** | **150** | **A** |
| **Company Description** | **227** | **40** | **A** |
| Tradable Instrument Code | 267 | 12 | A |
| Country Of Register | 279 | 2 | A |
| Tradable Instrument Display Mnemonic | 281 | 4 | A |
| Announcement Group Code | 285 | 4 | A |
| Category | 289 | 1 | A |
| SEAQ I Indicator | 290 | 1 | A |

| | | | |
|---|---|---|---|
| Related Announcement Headline (1) | 291 | 29 | A |
| Related Company Description (1) | 320 | 20 | A |
| Related Tradable Instrument Code (1) | 340 | 12 | A |
| Related Country Of Register (1) | 352 | 2 | A |
| Related Tradable Instrument Display Mnemonic (1) | 354 | 4 | A |
| Related Announcement Headline (2) | 358 | 29 | A |
| Related Company Description (2) | 387 | 20 | A |
| Related Tradable Instrument Code (2) | 407 | 12 | A |
| Related Country Of Register (2) | 419 | 2 | A |
| Related Tradable Instrument Display Mnemonic (2) | 421 | 4 | A |
| Related Announcement Headline (3) | 425 | 29 | A |
| Related Company Description (3) | 454 | 20 | A |
| Related Tradable Instrument Code (3) | 474 | 12 | A |
| Related Country Of Register (3) | 486 | 2 | A |
| Related Tradable Instrument Display Mnemonic (3) | 488 | 4 | A |
| Related Announcement Headline (4) | 492 | 29 | A |
| Related Company Description (4) | 521 | 20 | A |
| Related Tradable Instrument Code (4) | 541 | 12 | A |
| Related Country Of Register (4) | 553 | 2 | A |
| Related Tradable Instrument Display Mnemonic (4) | 555 | 4 | A |
| Non London Tradable Instrument Code (1) | 559 | 14 | A |
| Country of Primary Listing (1) | 573 | 4 | A |
| **Total Length** | **577 bytes** | | |

Fig 13. New **5NC** (AC) 'News Control' message

A new version of the News Text Message - 5NT AB needs to be created to allow the length of the Announcement Number field to be enlarged to 10.

| Field Name | Offset | Length | Format |
|---|---|---|---|
| **Announcement Number** | **37** | **10** | **A** |
| News Message Sequence Number | 47 | 4 | N |
| Announcement Message Text | 51 | 400 | A |
| **Total Length** | **451 bytes** | | |

Fig 14. New **5NT** (AB) 'News Text' message

The **5SH** 'News Service Header' and **5SB** 'News Service Trailer' messages will not be disseminated.

The **5ON (AB)** message will be sent to subscribers when the status of an index changes, e.g. Open or Close. The table below outlines each of the fields published.

| Field Name | Offset | Length | Format |
|---|---|---|---|
| Index Identifier | 37 | 50 | A |
| Index Status | 87 | 15 | A |
| Time of Change | 102 | 6 | N |
| **Total Length** | **108 bytes** | | |

Fig 15. **5ON** (AB) ‘Index Status’ message

The **5OU (AB)** message details the value of an index at a specified time and the difference of this value from the previous day’s closing value. The table below outlines each of the fields published.

| Field Name | Offset | Length | Format |
|---|---|---|---|
| Index Identifier | 37 | 50 | A |
| Index Value | 87 | 23 | N |
| Index Differential | 110 | 23 | S |
| Time of Index Value | 133 | 6 | N |
| Index Exceptional Status Indicator | 139 | 1 | A |
| **Total Length** | **140 bytes** | | |

Fig 16. **5OU** (AB) ‘Index Value’ message

## 4.10 Broadcast Notification Message (Infolect)

The **5BN** ‘Broadcast Notification’ message is used to inform users of specific, pre-defined Infolect system events via the use of a 5 character broadcast advisory code. This is currently configured to inform users of the completion of the morning reference data download. Once the morning download is complete a 5BN will be published with an advisory code of B001I. Any further message received on a reference data channel post the publication of the 5BN should be treated as a change/update and not part of the daily morning download.

| Field Name | Offset | Length | Format |
|---|---|---|---|
| Broadcast Notification Code | 37 | 5 | A |
| **Total Length** | **42 bytes** | | |

Fig 17. **5BN** ‘Broadcast Notification’ message

## 4.11 Oslo Tradable Instrument Types and Manual Trade Types (equities and fixed income)

The following instrument types will be used for the Oslo Børs cash equities and fixed income markets on TradElect:

| Code | Description |
|---|---|
| BO | BOND |
| CP | COMMERCIAL PAPER |
| SH | SHARE |
| PC | PRIMARY CAPITAL CERTIFICATES |
| RG | RIGHTS |
| WA | WARRANTS |
| FU | FUND UNITS |
| FC | FINANCIAL CERTIFICATES |
| ZP | ZERO COUPON COMMERCIAL PAPER |
| ZC | ZERO COUPON |

Fig 18. Oslo Tradable Instrument Types

The following additional manual trade types will be introduced for the Oslo Børs cash equities and fixed income markets on TradElect. Please Appendix B for a break down of which trade types are valid for each Segment:

| FIX Trade Sub type Enum | Trade Type | TradeType Description |
|---|---|---|
| 3000 | ON | *NON STANDARD SETTLEMENT* |
| 3001 | OR | *REPO* |
| 3002 | OH | *OTHER* |
| 3003 | OL | *ODD LOT* |
| 3004 | OU | *OUTSIDE OPENING HOURS* |
| 3005 | OE | *EXCHANGE GRANTED TRADE* |
| 3006 | DE | *EXCHANGE GRANTED TRADE DELAYED PUBLICATION* |
| 3007 | DN | *NON STANDARD SETTLEMENT DELAYED PUBLICATION* |
| 3008 | DR | *REPO DELAYED PUBLICATION* |

| | | |
|---|---|---|
| 3009 | DH | *OTHER DELAYED PUBLICATION* |
| 3010 | DL | *ODD LOT DELAYED PUBLICATION* |
| 3011 | DU | *OUTSIDE OPENING HOURS DELAYED PUBLICATION* |
| 3012 | DT | *DERIVATIVES TRADE* |
| 3013 | VW | *VWAP TRADE* |

Fig 19. Oslo Manual Trade Types

## 4.12 Infolect Oslo Service Channels

This section provides a comprehensive list of all of the Oslo Børs Service Channels including message types. New messages or changes to existing messages are highlighted in red.

### 4.12.1 Oslo Equity Level 1

The Oslo Equity Level 1 data service contains base data and derived data. A new message type, 5LL, has been added for the Trade High/Low Last.

| Service Name | Channel |
|---|---|
| **Oslo Equity Level 1** | **G01** |

*MESSAGE TYPES THAT MAY BE BROADCAST OVER THIS CHANNEL:*

| | |
|---|---|
| **5DV** | Cumulative Number and Volume of Trades |
| **5EM** | Ex Marker Status |
| **5IP** | Idle Poll |
| **5OZ** | **Trade Report** |
| **5PR** | Opening Price |
| **5SF** | **Best Price and Volume** |
| **5SK** | Closing Price |
| **5UD** | **Uncrossing Price and volume** |
| **5VW** | VWAP from Automatic Trades |
| **5LL** | **Trade High/Low Last** |

### 4.12.2 Oslo Equity Level 2

The Oslo Equity Level 2 data service provides all the information required to display a full depth order book and market control messages.

| **Service Name** | **Channel** |
|---|---|
| **Oslo Equity Level 2** | **G02** |

*MESSAGE TYPES THAT MAY BE BROADCAST OVER THIS CHANNEL:*

| | |
|---|---|
| **5CT** | Tradable Instrument Control |
| **5EM** | Ex-Marker Status |
| **5IP** | Idle Poll |
| **5MN** | Member Role in Instrument |
| **5MK** | Market Status Information |
| **5OE** | Order Deletion/Expiry/Fully Matched |
| **5OL** | Temporary Period for tradable Instrument/Currency |
| **5OM** | Period for Market Sector |
| **5OO** | **Order Details** |
| **5OV** | Tradable Instrument/Currency Period Change |
| **5OW** | Sector Period Change |
| **5SX** | Uncrossing Completed |

### 4.12.3 Oslo Equity Reference Data

The Oslo Equity Reference Data service provides market, instrument, Segment and participant reference data. A new message type, 5BN, has been added for Broadcast Notifications.

| Service Name | Channel |
|---|---|
| **Oslo Equity Reference Data** | **G03** |
| *MESSAGE TYPES THAT MAY BE BROADCAST OVER THIS CHANNEL:*<br><br>**5BN** **Broadcast Notification**<br>**5EM** Ex Marker Status<br>**5ER** Equity Background Data<br>**5IP** Idle Poll<br>**5IS** Instrument Trading Data<br>**5MN** Member Role in Instrument<br>**5MS** Member in Segment<br>**5OM** Period for Market Sector<br>**5SD** Segment Description<br>**5SS** Sector Description<br>**5TM** Tick Size Matrix for Segment / Currency<br>**5TY** Trade Type for Segment<br>**5VI** Settlement Venue for Tradable Instrument | |

### 4.12.4 Oslo Fixed Income Level 1

The Oslo Fixed Income Level 1 data service contains base data and derived data. A new message type, 5LL, has been added for the Trade High/Low Last has been added.

| **Service Name** | **Channel** |
| --- | --- |
| **Oslo Fixed Income Level 1** | **G04** |

*MESSAGE TYPES THAT MAY BE BROADCAST OVER THIS CHANNEL:*

| | |
| --- | --- |
| **5DV** | Cumulative Number and Volume of Trades |
| **5EM** | Ex Marker Status |
| **5IP** | Idle Poll |
| **5OZ** | **Trade Report** |
| **5SF** | **Best Price and Volume** |
| **5UD** | **Uncrossing Price and volume** |
| **5VW** | VWAP from Automatic Trades |
| **5LL** | **Trade High Low Last** |

### 4.12.5 Oslo Fixed Income Level 2

The Oslo Fixed Income Level 2 data service provides all the information required to display a full depth order book and market control messages. Please note that **5OO** 'Order Details' messages for the OBBA, OBIA and OBUB Segments will only be disseminated on G15, not G05.

| Service Name | Channel |
|---|---|
| **Oslo Fixed Income Level 2** | **G05** |

*MESSAGE TYPES THAT MAY BE BROADCAST OVER THIS CHANNEL:*

| | |
|---|---|
| **5CT** | Tradable Instrument Control |
| **5EM** | Ex-Marker Status |
| **5IP** | Idle Poll |
| **5MN** | Member Role in Instrument |
| **5MK** | Market Status Information |
| **5OE** | Order Deletion/Expiry/Fully Matched |
| **5OL** | Temporary Period for tradable Instrument/Currency |
| **5OM** | Period for Market Sector |
| **5OO** | **Order Details** |
| **5OV** | Tradable Instrument/Currency Period Change |
| **5OW** | Sector Period Change |
| **5SX** | Uncrossing Completed |

### 4.12.6 Oslo Fixed Income Reference Data

The Oslo Fixed Income Reference Data service provides market, instrument, Segment and participant reference data. Two new message types have been added. The 5BN message type has been added for Broadcast Notifications and the 5FI message type will include Fixed Income specific reference data.

| Service Name | Channel |
|---|---|
| **Oslo Fixed Income Reference Data** | **G06** |

*MESSAGE TYPES THAT MAY BE BROADCAST OVER THIS CHANNEL:*

| | |
|---|---|
| **5BN** | **Broadcast Notification** |
| **5EM** | Ex Marker Status |
| **5ER** | Equity Background Data |
| **5IP** | Idle Poll |
| **5IS** | Instrument Trading Data |
| **5MN** | Member Role in Instrument |
| **5MS** | Member in Segment |
| **5OM** | Period for Market Sector |
| **5SD** | Segment Description |
| **5SS** | Sector Description |
| **5TM** | Tick Size Matrix for Segment / Currency |
| **5TY** | Trade Type for Segment |
| **5VI** | Settlement Venue for Tradable Instrument |
| **5FI** | **Fixed Income Reference Data** |

#### 4.12.7 Oslo Warrants Level 1

The Oslo Warrants Level 1 data service contains base data and derived data. A new message type, 5LL, has been added for the Trade High/Low Last.

| Service Name | Channel |
|---|---|
| **Oslo Warrants Level 1** | **G07** |

*MESSAGE TYPES THAT MAY BE BROADCAST OVER THIS CHANNEL:*

**5DV** Cumulative Number and Volume of Trades
**5EM** Ex Marker Status
**5IP** Idle Poll
**5OZ** **Trade Report**
**5PR** Opening Price
**5SF** **Best Price and Volume**
**5SK** Closing Price
**5UD** **Uncrossing Price and Volume**
**5VW** VWAP from Automatic Trades
**5LL** **Trade High Low Last**

### 4.12.8 Oslo Warrants Level 2

The Oslo Warrants Level 2 data service provides all the information required to display a full depth order book and market control messages.

| Service Name | Channel |
|---|---|
| **Oslo Warrants Level 2** | **G08** |

*MESSAGE TYPES THAT MAY BE BROADCAST OVER THIS CHANNEL:*

| | |
|---|---|
| **5CT** | Tradable Instrument Control |
| **5EM** | Ex-Marker Status |
| **5IP** | Idle Poll |
| **5MN** | Member Role in Instrument |
| **5MK** | Market Status Information |
| **5OE** | Order Deletion/Expiry/Fully Matched |
| **5OL** | Temporary Period for tradable Instrument/Currency |
| **5OM** | Period for Market Sector |
| **5OO** | **Order Details** |
| **5OV** | Tradable Instrument/Currency Period Change |
| **5OW** | Sector Period Change |
| **5SX** | Uncrossing Completed |

### 4.12.9 Oslo Warrants Reference Data

The Oslo Equity Reference Data service provides market, instrument, Segment and participant reference data. A new message type, 5BN, has been added for Broadcast Notifications.

| Service Name | Channel |
|---|---|
| **Oslo Warrants Reference Data** | **G09** |

*MESSAGE TYPES THAT MAY BE BROADCAST OVER THIS CHANNEL:*

| | |
|---|---|
| **5BN** | **Broadcast Notification** |
| **5EM** | Ex Marker Status |
| **5ER** | Equity Background Data |
| **5IP** | Idle Poll |
| **5IS** | Instrument Trading Data |
| **5MN** | Member Role in Instrument |
| **5MS** | Member in Segment |
| **5OM** | Period for Market Sector |
| **5SD** | Segment Description |
| **5SS** | Sector Description |
| **5TM** | Tick Size Matrix for Segment / Currency |
| **5TY** | Trade Type for Segment |
| **5VI** | Settlement Venue for Tradable Instrument |

### 4.12.10 Oslo Market Status Indicators

The Oslo Market Status Indicators service is used to disseminate market status and market control messages for the Oslo markets for customers who do not take Level 2 data.

| **Service Name** | **Channel** |
| --- | --- |
| **Oslo Market Status Indicators** | **G10** |

*MESSAGE TYPES THAT MAY BE BROADCAST OVER THIS CHANNEL:*

| | |
| --- | --- |
| **5CT** | Tradable Instrument Control |
| **5IP** | Idle Poll |
| **5MK** | Market Status Information |
| **5MN** | Member Role in Instrument |
| **5OL** | Temporary Period for tradable Instrument/Currency |
| **5OM** | Period for Market Sector |
| **5OV** | Tradable Instrument/Currency Period Change |
| **5OW** | Sector Period Change |
| **5SX** | Uncrossing Completed |

### 4.12.11 Oslo Market Reference Data

The Oslo Market Reference Data service provides general information on instruments, participants and companies in the Oslo markets.

| **Service Name** | **Channel** |
|---|---|
| **Oslo Market Reference Data** | **G11** |

*MESSAGE TYPES THAT MAY BE BROADCAST OVER THIS CHANNEL:*

| | |
|---|---|
| **5BN** | **Broadcast Notification** |
| **5HM** | Period Handling for Market Mechanism Type |
| **5HV** | Period Handling for Validity Type |
| **5IP** | Idle Poll |
| **5MR** | Member Details |
| **5MT** | Market Description |
| **5PE** | Period Extensions |
| **5PU** | Period Rules |
| **5PM** | Period Rules for Market Mechanism & Validity Type |
| **5SV** | Settlement Venue |

### 4.12.12 Oslo News

The Oslo news service provides all full text regulatory announcements notified by listed and designated companies defined by Oslo Bors.

| **Service Name** | **Channel** |
|---|---|
| **Oslo News** | **G12** |

*MESSAGE TYPES THAT MAY BE BROADCAST OVER THIS CHANNEL:*

| | |
|---|---|
| **5IP** | Idle Poll |
| **5NC** | **News Control** |
| **5NT** | **News Text** |

### 4.12.13 Oslo Indices

The Oslo Indices service provides indices information.

| Service Name | Service Channel |
| --- | --- |
| **Oslo Indices** | **G13** |

*MESSAGE TYPES THAT MAY BE BROADCAST OVER THIS CHANNEL:*

**5IP** Idle Poll
**5ON** Index Status
**5OU** Index Value

### 4.12.14 Oslo Government Bond Auction Level 1

The Oslo Government Bond Auction Level 1 data service contains relevant base data and derived data only. Please note that this is a private channel for Norges Bank (Norway's central bank).

| Service Name | Channel |
| --- | --- |
| **Oslo Government Bond Auction Level 1** | **G14** |

*MESSAGE TYPES THAT MAY BE BROADCAST OVER THIS CHANNEL:*

**5DV** Cumulative Number and Volume of Trades
**5EM** Ex Marker Status
**5IP** Idle Poll
**5OZ** **Trade Report**

### 4.12.15 Oslo Government Bond Auction Level 2

The Oslo Government Bond Auction Level 2 data service provides all the information required to display a full depth order book and market control messages. Please note that this is a private channel for Norges Bank (Norway's central bank).

| Service Name | Channel |
|---|---|
| **Oslo Government Bond Auction Level 2** | **G15** |

*MESSAGE TYPES THAT MAY BE BROADCAST OVER THIS CHANNEL:*

| | |
|---|---|
| **5CT** | Tradable Instrument Control |
| **5EM** | Ex-Marker Status |
| **5IP** | Idle Poll |
| **5MN** | Member Role in Instrument |
| **5MK** | Market Status Information |
| **5OE** | Order Deletion/Expiry/Fully Matched |
| **5OL** | Temporary Period for tradable Instrument/Currency |
| **5OM** | Period for Market Sector |
| **5OO** | **Order Details** |
| **5OV** | Tradable Instrument/Currency Period Change |
| **5OW** | Sector Period Change |
| **5SX** | Uncrossing Completed |

# 5. Testing

## 5.1 Conformance Requirements

Conformance testing is mandatory for all customers who wish to access the Oslo Børs markets on *TradElect* and *Infolect* unless they can demonstrate that no software changes are required in order to support these changes. Customers should contact Oslo Børs or their Technical Account Manager for more information if they are not sure if they are exempt from the conformance testing.

## 5.2 Customer Development Service

The Customer Development Service (CDS) environment was updated on 7 September 2009. A *Testing and Migration Guide* is available and provides full details on how to connect and use both the CDS and conformance test environments.

## 5.3 Accreditation Policy

The Exchange strongly recommends that all customers who want to access the Oslo Børs markets fully test the functionality on the CDS service. The Exchange's Accreditation policy mandates a conformance test for all customers who have to make code changes to their systems to support the new markets.

# 6. Migration Approach

The launch of the Oslo Børs equities and fixed income markets on *TradElect* and *Infolect* will be performed using a ‘big bang’ style migration and is scheduled for 12 April 2010. Customers will have the opportunity to test their cutover activities by using a series of mandatory dress rehearsals, see section *2 Project Implementation* for dates. These dress rehearsal weekends will be performed against the production environment.

A *Testing and Migration Guide* will be sent out prior to the first dress rehearsal. This guide will provide full details on how to connect to the production environment and behaviour customers will be expected to demonstrate.

# Appendix A – Message Versions

Appendix A provides a comprehensive list of all of the Oslo Services including message types. New messages or changes to existing messages are highlighted in red.

| Message Type | London Version | Oslo Version | Difference | Message Name |
|---|---|---|---|---|
| 5BN | | AA | New Message | Broadcast Notification |
| 5CT | AA | AA | | Tradable Instrument Control |
| 5DV | AA | AA | | Cumulative Number and Volume of Trades |
| 5EM | AA | AA | | Ex-Marker Status |
| 5ER | AA | AA | | Equity Background Data |
| 5FI | | AA | New Message | Fixed Income Reference Data |
| 5HM | AA | AA | | Period Handling for Market Mechanism Type |
| 5HV | AA | AA | | Period Handling for Validity Type |
| 5IP | AA | AA | | Idle Poll |
| 5IS | AA | AA | | Instrument Trading Data |
| 5LL | | AA | New Message | Trade High Low Last |
| 5MK | AA | AA | | Market Status Information |
| 5MN | AA | AA | | Member Role in Instrument |
| 5MR | AA | AA | | Member Details |
| 5MS | AA | AA | | Member in Segment |
| 5MT | AA | AA | | Market Description |
| 5NC | AB | AC | Oslo defined news | News Control |
| 5NT | AA | AB | News 10 character ID | News Text |
| 5OE | AA | AA | | Order Deletion/Expiry/Fully Matched |
| 5OL | AA | AA | | Temporary Period for a Tradable Instrument/Currency |
| 5OM | AA | AA | | Period for Market Sector |
| 5ON | AB | AB | | Index Status |
| 5OO | AC | AD | Yield Price | Order Details |
| 5OU | AB | AB | | Index Value |
| 5OV | AA | AA | | Tradable Instrument/Currency Period Change |
| 5OW | AA | AA | | Sector Period Change |
| 5OZ | AB | AC | Yield, Counterparties, Settlement Dates | Trade Report |
| 5PE | AA | AA | | Period Extension |
| 5PM | AA | AA | | Period Rules for Market Mechanism and Validity Type |
| 5PP | AA | AA | | Price/Earnings Ratio and Market Capitalisation |
| 5PR | AA | AA | | Opening Price |
| 5PU | AA | AA | | Period Rules |
| 5SB | AA | AA | | News Service Trailer |
| 5SD | AA | AA | | Segment Description |
| 5SF | AA | AB | Yield Price | Enhanced Best Price |
| 5SG | AA | Not Used | | Announcement (Marker sent on Level 2 to indicate an announcement has occurred) |

| | | | | |
|---|---|---|---|---|
| 5SH | AA | AA | | News Service Header |
| 5SK | AA | AA | | Closing Price : Non-Fixed Income Channels |
| 5SL | AA | Not Used | | DOL Quotation Information |
| 5SN | AA | Not Used | | Quote Close |
| 5SS | AA | AA | | Sector Description |
| 5SV | AA | AA | | Settlement Venue |
| 5SX | AA | AA | | Uncrossing Completed |
| 5TH | AA | Not Used | | Trade High/Low |
| 5TM | AA | AA | | Tick Size Matrix for Segment/Currency |
| 5TY | AA | AA | | Trade Type for Segment |
| 5UD | AA | AB | Yield Price | Uncrossing Price and Volume |
| 5VI | AA | AA | | Settlement Venue for Tradable Instrument |
| 5VO | AA | Not Used | | VWAP from Trades |
| 5VW | AA | AA | | VWAP from Automatic Trades |

# Appendix B – Trade Types per Segment

Appendix B provides a comprehensive list of all of the Oslo trade types valid for each Oslo market Segment.

| Segment Code | Trade Type |
|---|---|
| OABM | DE |
| OABM | DH |
| OABM | DL |
| OABM | DN |
| OABM | DR |
| OABM | DU |
| OABM | O |
| OABM | OE |
| OABM | OH |
| OABM | OK |
| OABM | OL |
| OABM | ON |
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