Consolidated Audit Trail

Intrafirm Linkage Overview

Agenda

1.) Timelines

2.) General Processing Overview

3.) Feedback and Corrections

4.) Release 2.2 Screens

5.) Compliance Error Rates

6.) Q&A

Timelines

Phase 2a/2b Timelines

Release	Test Environment Deployment Date	Production Environment Deployment Date	Compliance Go-Live Date
1- File Submission & Data Integrity	December 16, 2019 (multiple releases)	April 13, 2020 (multiple releases)	June 22, 2020 (Phase 2a)
			July 20, 2020 (Phase 2b)
2- Intrafirm Linkage	April 20, 2020 (multiple releases)	May 4, 2020 (multiple releases)	July 27, 2020 (Phase 2a)
			August 24, 2020 (Phase 2b)
3- Interfirm Linkage	July 27, 2020	August 10, 2020	October 26, 2020 (Phase 2a)
			January 4, 2021 (Phase 2b)
4- Exchange/ TRF Linkage	September 9, 2020	September 28, 2020	October 26, 2020 (Phase 2a)
			January 4, 2021 (Phase 2b)

Release 2 – Intrafirm Release Rollout

Intrafirm Release 2.1 Industry Test – 4/20/2020	Intrafirm Release 2.1 Production – 5/4/2020	Intrafirm Release 2.2 Industry Test – 5/18/2020 Production – 5/18/2020	Intrafirm Release 2.3 Industry Test – 6/1/2020 Production – 6/1/2020	Intrafirm Release 2.4 Industry Test – 6/29/2020 Production – 6/29/2020
• Industry Test Open for Machine-to-Machine Intrafirm Validations & Feedback • CAT Reporter Portal: Basic Intrafirm Statistics	• Production Open for Machine-to-Machine Intrafirm Validations & Feedback	CAT Reporter Portal • Linkage File feedback • Basic Intrafirm Statistics Simplified Screen-Intrafirm Errors/Warnings Counts • Remove 3008/3009 Error Codes	CAT Reporter Portal • Linker Error Statistics (i.e. number of records with Linker Errors or Warnings by Error Codes) • Comprehensive Intrafirm Statistics (including adding Attempted counts, Repaired Records and Adjusted Intrafirm Error Rates)	CAT Reporter Portal • Ability to view and correct Intrafirm Linkage Errors

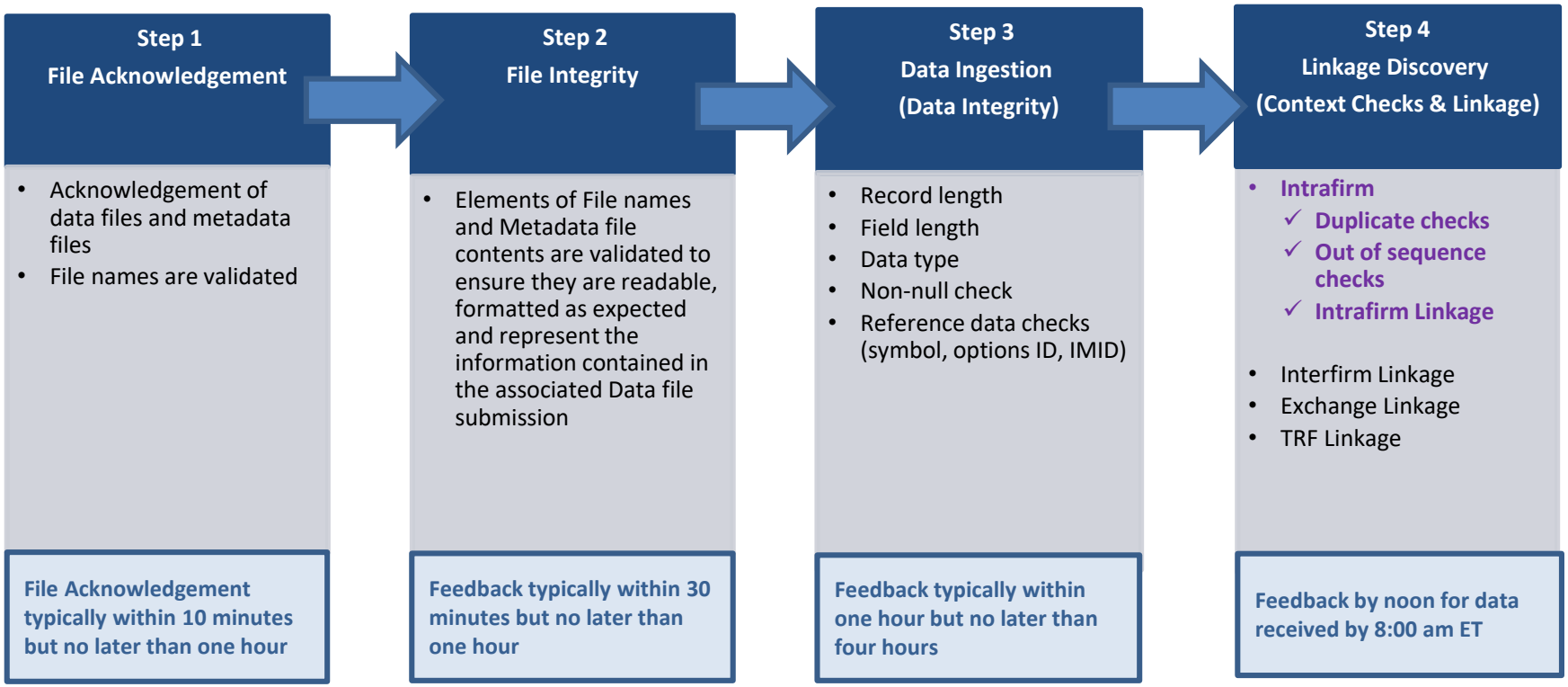
Phase 2a Intrafirm Compliance Date – 7/27/2020
Phase 2b Intrafirm Compliance Date – 8/24/2020

General Processing Overview

General Overview – CAT Data Processing

- The CAT Plan Processor ingests and validates data to ensure it is submitted in accordance with the *CAT Reporting Technical Specifications for Industry Members*
- The CAT Plan Processor provides specific feedback to CAT Reporters to assist them with Compliance obligations
- The CAT Plan Processor provides tools and resources to assist firms in correcting erroneous data

CAT Processing



Intrafirm Processing Steps

Seq	Linkage Discovery Step	Feedback
1	Full Duplicate Checks	When duplicates are found, one record is kept and all others are rejected.
2	Key Duplicate Checks	When an Event key or a Firm ROE ID is duplicated, all events having the same key are rejected.
3	Intrafirm Linkage and Out of Sequence	Events within a firm that do not link AND Events within a firm that are linked but are out of sequence.

Feedback and Corrections

Intrafirm Feedback Mechanisms

Feedback Types	SFTP	CAT Reporter Portal
Duplicate Errors Events which fail duplicate validations	✓	✓
Unlinked Errors Events including a linkage key for which a linkage was not made	✓	✓
Out of Sequence Errors Events within a CAT Reporter which appear to be out of sequence	✓	✓
Corrections Feedback • Corrections made for repairable errors will be reflected as Repaired • Unlinked events reconciled through the correction of another event will be reflected as Repaired • Unrepaired statistics will represent the number of Repairable Errors which remain unrepaired		✓

Feedback Format & Availability

Feedback delivered via SFTP

- The feedback format will match the format of the original submission
- Feedback files will be accessible in the Submitter's feedback directories
- Feedback for data submitted by a CAT Reporting Agent on behalf of a CAT Reporter will be accessible under the CAT Reporter's feedback directories if the CAT Reporter has an SFTP account
- Feedback will remain available for 10 calendar days

Feedback available on the Reporter Portal

- Machine formatted feedback files for all submission types will be accessible for download by the CAT Reporter and Submitter
- Machine formatted feedback files will remain available for 10 days

Intrafirm Error Codes

Error Code	Type	Explanation
397	Warning	Event reported beyond the linkage processing window; such events are considered late and will participate in the Error Rate in the Late category.
398	Warning	When Intrafirm linkage is not successful, secondary events having an Event Key Date which is prior to CAT go-live will be assigned this Warning.
399	Warning	When an event is fully duplicated, one version is accepted and all other versions are rejected.
3002, 3003	Rejection	Duplicated Firm ROE ID. Firm ROE ID must be unique for the Event Date and CAT Reporter IMID.
3004, 3007, 3010, 3011, 3012, 3015, 3016, 3017	Rejection	Duplicated Event Key. Event Key must be unique for the Key Date, Key ID, CAT Reporter IMID, Event Date and Symbol. All events having a duplicated key are rejected.
3008, 3009		*Retired*
3501	Unlinked Error	Secondary event is unlinked to the Primary event. "Parent Not Found". Errors occur when Primary event was rejected or not reported, or when the Event Key is incorrect.
3502, 3503, 3504	Unlinked Error	Side details or Aggregated Orders references one or more orders that are not found. Errors occur when orders that is referenced was rejected or not reported, or when the Order Key that is referenced is incorrect.
3601	Out of Sequence	Linkage occurred between primary and secondary event, but the timestamps were out of sequence.
3602	Out of Sequence	Supplement event has an event timestamp that is different from the event that it is supplementing. CAT Reporting requires these times to be equal.

Intrafirm Linkage

- Included:
  - Secondary events where a linkage to a primary event is required including Routes, Cancels, Child Orders, Internal Routes, Modifications, Adjustments and Supplements
  - Fulfillment and Trade Events where orders are populated in the side details
  - Representative orders / Aggregations where orders are populated in the Aggregated Orders field

- Unlinked Events are delivered when an Intrafirm Linkage was not made, excluding:
  - Full and Event Key Duplicates
  - Events originated prior to CAT go-live
  - Events reported beyond the processing window
  - Representative order not required to link

Correcting Intrafirm Duplicate and Unlinked Errors

Error Feedback

- Error feedback returned to CAT Reporters will include the associated Error Code(s) and the Error Record Identifier - *errorROEID*
- Assigned an initial repair status of Unrepaired ('U')

Reporting Corrections

- Distinguished using the Action Type Code
  - **'RPR' –** must include *errorROEID* of the CAT identified error being corrected
  - **'COR'** – must include *firmROEID* of the CAT identified error or CAT Reporter reporting error being corrected
  - **'DEL'** – may include the *errorROEID* or the *firmROEID*
- The use of a 'DEL' event can be used to remove an erroneous event which resulted in an error

Duplicate Order Key Correction

Rejected Events Due to Duplicated Order Keys						
Action Type	**Event**	**Order Key**	**FirmROEID**	**ErrorROEID**	**Error Code**	
NEW	MENO	4/24/2020, IMIDA, AAPL, 12345	04242020_11	1	3004	
NEW	MEOR	4/24/2020, IMIDA, AAPL, 12345	04242020_22	2	3004	
NEW	MENO	4/24/2020, IMIDA, AAPL, 12345	04242020_33	3	3004	
NEW	MEOC	4/24/2020, IMIDA, AAPL, 12345	04242020_44	4	3004	
Corrections / Audit Trail						
Action Type	**Event**	**Order Key**	**FirmROEID**	**ErrorROEID**		**CATOrderID**
RPR	MENO	4/24/2020, IMIDA, AAPL, 67890	04242020_11	1	Corrected Key	112233
RPR	MEOR	4/24/2020, IMIDA, AAPL, 67890	04242020_22	2	Corrected Key	112233
RPR	MENO	4/24/2020, IMIDA, AAPL, 12345	04242020_33	3	Resubmit	445566
RPR	MEOC	4/24/2020, IMIDA, AAPL, 12345	04242020_44	4	Resubmit	445566

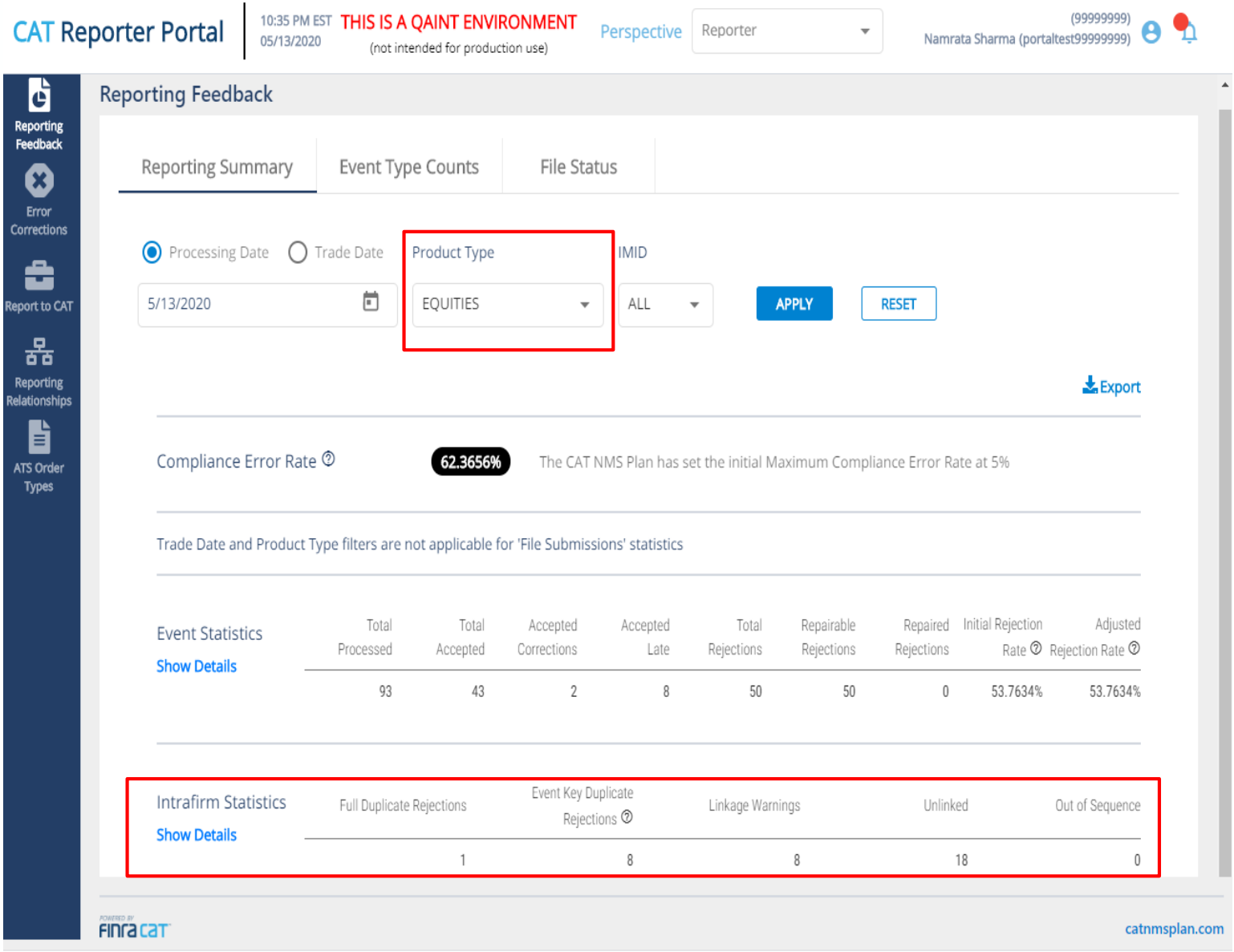
- IMIDA corrects MENO/MEOR to create unique Order Key
- IMIDA resubmits MENO/MEOC
- All events will be considered repaired and participate in Intrafirm Linkage

Intrafirm Linkage Correction

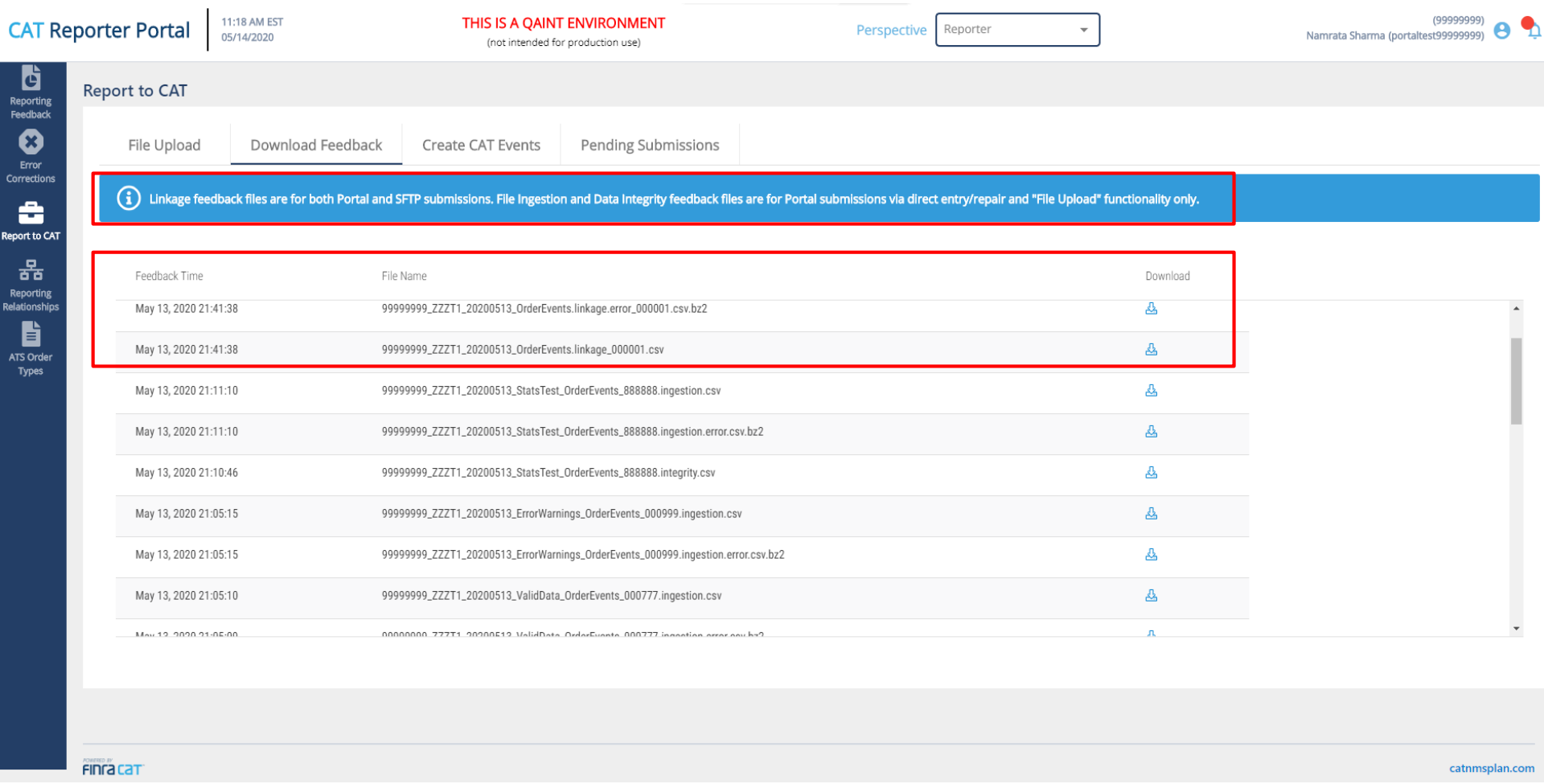
Unlinked Intrafirm Events						
Action Type	**Event**	**Order Key**	**ClientDetails**	**FirmROEID**	**ErrorROEID**	**Error Code**
NEW	MEOC	4/24/2020, IMIDA, AAPL, 12345		04242020_44	4	3501
NEW	MEOF	4/24/2020, IMIDA, GOOG, 44556	4/24/2020, 87654, B	04242020_78	5	3503
Late Submissions / Audit Trail						
Action Type	**Event**	**Order Key**		**FirmROEID**		**CATOrderID**
NEW	MENO	4/24/2020, IMIDA, AAPL, 12345		04242020_33	Late Submission	998877
NEW	MEOC	4/24/2020, IMIDA, AAPL, 12345		04242020_44		998877
NEW	MENO	4/24/2020, IMIDA, GOOG, 87654		04242020_11	Late Submission	554433
NEW	MEOF	4/24/2020, IMIDA, GOOG, 44556	4/24/2020, 87654, B	04242020_78		554433

- IMIDA submits late MENO events
- Unlinked MEOC and MEOF events will automatically be repaired through reconciliation

Release 2.2 Screens



- **Basic Statistics by Product Type**
- **Exclude Route Key Duplicate Rejections**
- **Update labels for Intrafirm Rejections and Errors**



➢Download functionality for Linkage Feedback files is limited to individual files being less than 5MB.

Compliance Error Rates

Overall Compliance Error Rate

Compliance Go-Live	Date	Calculation
Equities 2a file submission and data integrity validations	06/22/2020	**Equities Only** (Late + Ingestion Outstanding Rejections)/Total Processed
Options 2b file submission and data integrity validations	07/20/2020	**Equities and Options** (Late + Ingestion Outstanding Rejections)/Total Processed
Equities Phase 2a Intrafirm Compliance Date	07/27/2020	**Equities Only** (Late + Ingestion & Linker Outstanding Rejections + Outstanding Intrafirm Unlinked Errors + Outstanding Out of Sequence Errors)/Total Processed
Options Phase 2b Intrafirm Compliance Date	08/24/2020	**Equities and Options** (Late + Ingestion & Linker Outstanding Rejections + Outstanding Intrafirm Unlinked Errors + Outstanding Out of Sequence Errors)/Total Processed

Outstanding Rejections for file submission and data integrity validations only include Ingestion Rejections

Outstanding Rejections for Intrafirm include Ingestion Rejections + Event Key Duplicate Rejections

Q & A

How to Ask a Question during Today's Call

- **For participants using computer audio:**
  - Click the "Raise Hand" button at the bottom of the participants window.
  - A visual prompt will indicate that your line has been unmuted.

- **For participants using phone audio:**
  - Enter *9 on your phone keypad.
  - An audio prompt will indicate that your line has been unmuted.