Business rules to optimise the use of AQ amendment system capacity

Objectives

1. Ensure that sufficient capacity is available to process each shipper's daily allowance each day within the AQ amendment window should it wish to use it (subject to the age and size of files that the Shipper has submitted).

2. Maximise use of a shipper's daily allowance.

3. Maximise use of unused capacity so that shippers who wish to submit a higher proportion AQ amendments (i.e. above their allotted allowance) can do so.

4. Subject to practicalities, manage utilisation of daily unused capacity in an equitable manner.

Rules

Constraints

1. **Maximum MPs per file**, i.e. maximum file size (MFS) = [20,000] MPs
2. **Maximum MPs per day** submitted in all files by a per shipper in a day = the daily system capacity (DSC)
3. **Daily system capacity** (DSC) = [250,000]
4. **Shipper daily allowance** (MPs per day) = SDA = [predefined values for each shipper variable by NDM portfolio size as determined on a defined day (taking into account the following), or 500 AQ Amendment submissions or a Shippers total portfolio where less than 500]
5. xoserve will process **whole files only**
6. **xoserve will neither partially process, nor split files** that cannot be processed within [a] the shipper's remaining daily allowance or [b] the remaining total system daily capacity
7. **Files must be received by an agreed deadline** to be included in a shipper's daily allowance; this deadline is proposed to be 5pm.

Processing rules

1. **Processing a shipper's daily allowance:**
   - Each shipper's daily allowance will always be processed on each day the process runs

   - A shipper's files will be included in their daily allowance in file age order (oldest first), so files "rolled over" (from a day when a shipper submitted more than their daily allowance) will be included before files submitted by the shipper on the relevant processing day (i.e. since the processing ended the previous day).

2. **To maximise utilisation of unused daily system capacity:**
   - At any time in the scheduled runtime when all files included in all shipper's daily allowances have been processed, files from any shipper (who has submitted more than their daily allowance on the day or a previous day) will be processed via an appropriate method by giving preference to shippers who thus far have used the least of their total allowance.

File rejection reasons

1. **Daily System Capacity exceeded:** The total number of MPs submitted on a day exceeds the system daily capacity. Files will be rejected via one of the following methods…

    - All files from the shipper on that day are rejected (as previous days files contain their SDA), or…

    - Whole files will be selected for acceptance on receipt time order until cumulative record number would exceed the system daily capacity, in which case the file that causes the breach of the limit and all later files would be rejected.

2. **Maximum file size exceeded:** The number of MPs in a file exceeds max file size

3. **Insufficient capacity**: Subject to rules governing utilisation of unused capacity, there is already insufficient capacity left in the whole AQ amendment processing schedule to process the file from the shipper.

MI and Communication

1. Daily, throughout the amendment window:

- Monitor for each shipper the portion of their total allowance that has already been processed by the end of the previous day.

2. Periodically, throughout the amendment window, notify each shipper of…

- On exception: report any file that was not included in a shipper's daily allowance and has not been processed via unused system capacity within [5] days of submission.

Approach to managing utilisation of unused capacity

Rules:

Each day where un-used processing capacity exists after processing each Shipper's submissions, utilise the unused capacity by processing files from shippers who still have files to process giving preference to the shippers who, at the end of the previous day, had thus far used the lowest portion of the total allowance for the whole window. Files from these shippers would be processed in time received order.

If the selected shipper's next oldest file exceeds the remaining unused capacity then either

[a] Select the next file from the same shipper

[b] Select the next shipper under the same criteria

On the first day of the window, unused capacity will be utilised by the oldest files first.

Worked examples:

For simplicity assume AQ amendment window lasts 100 days, and all volumes are in 1,000s (Ks)

System daily capacity = 25 and has been allocated to four shippers as follows….

Shipper 1

Shipper Daily allowance: SDA1 = 10

Shipper Total allowance: STA1 = 1,000

Shipper 2

Shipper Daily allowance: SDA2 = 5

Shipper Total allowance: STA2 = 500

Shipper 3

Shipper Daily allowance: SDA3 = 5

Shipper Total allowance: STA3 = 500

Shipper 4

Shipper Daily allowance: SDA4 = 5

Shipper Total allowance: STA4 = 500

By day 40

400 have already been processed for Shipper 1, i.e. **40%** of their total allowance

400 have already been processed for Shipper 2, i.e. **80%** of their total allowance

300 have already been processed for Shipper 3, i.e. 60% of their total allowance

350 have already been processed for Shipper 4, i.e. 70% of their total allowance

On day 41

Shipper 1 submits 15, i.e. **5** over their daily allowance

Shipper 2 submits 10, i.e**. 5** over their daily allowance

Shipper 3 submits 5,   i.e., their daily allowance

Shipper 4 submits 0,   i.e., 5 under their daily allowance

Having processing each Shipper's daily allowance, the un-used processing capacity = 5

Caveat: "subject to 'Constraints point 6" i.e. files will not be partially processed or split and therefore only whole files that would result in aggregate volumes below the Daily system capacity will be processed.

Outcome

All unused capacity will be utilised for Shipper 1 since they have the lowest % (40) of their total allowance already processed.