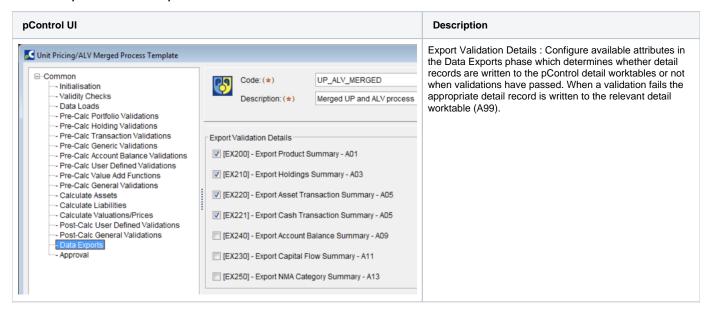
Fund Oversight - Detailed

- (ii)
- ... build understanding of NAV Validation data flow from input to validation result
 - Validation
 - 2. Auto Clearance process that runs on each validation entity with the goal of clearing exceptions for a specific validation.
 - 3. Manual Clearance
 - 4. Fund Signoff

Validation

- · pControl asset level validation has processing phases, like below UI example and a number of activities performed in each phase
- · Data Exports is one of the phase and it exports all information required for external analysis or reporting purposes
- all information is exported to pControl export buffers

UI example of data exports

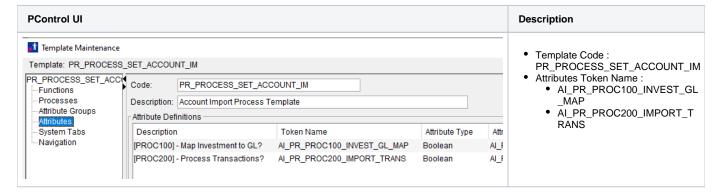


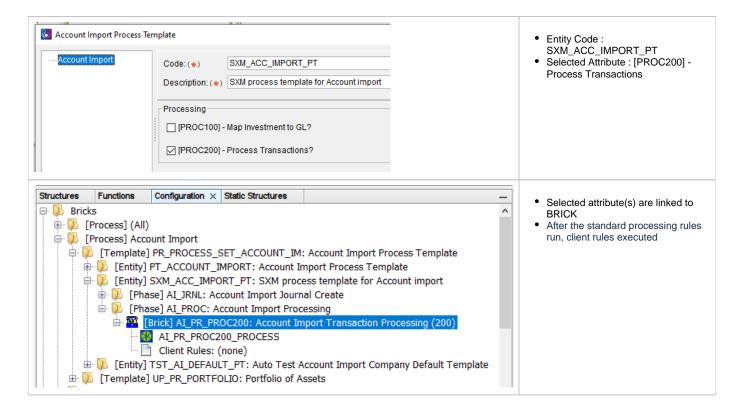
Entity-Validation Relationship

A current NAV validation check flow with relationships between entity and rules (retrieved from 6_mgp_dev).

- 1. Process template is set per entity, and has defined attributes
- 2. Attribute(s) are selected in an entity
- 3. Selected attribute(s) are linked to BRICK (A BRICK is a configuration file, rules configuration entity in pControl)
- 4. A client specific Rules file to execute after the standard processing rule TBD

UI example of configuration file





SQL example of configuration file

SQL example of tolerances in NAV validation

Tolerances are defined in L200. These run through bricks to determine the records relevant for each check per fund. Mostly determined by where the current entity sits on the processing tree.

```
-- when the entity code is 'TST_UP_HLD113_01_POOL'
select * from 1200_tolerance
where
       effective_date <= '20210308'
       and (p_status is null or p_status <> 'D')
       and entity_code in ('TST_UP_HLD113_01_POOL',
'TST_UP_HLD113_01', 'TST_UP_20_HLD', 'TST_UP_NAV_CONTROL', 'TST_UP', 'TST_TEST_CASES', 'TEST_CASES', 'DEFAULT')
       and pcontrol_code + ',' + entity_code + ',' + COALESCE(conditional_text, ' ') + ',' + effective_date +
',' + COALESCE(category_code, ' ') + ',' + COALESCE(price_run_type, ' ')
               (SELECT pcontrol_code + ',' + entity_code + ',' + COALESCE(conditional_text, ' ') + ',' + max
(effective_date) + ',' + COALESCE(category_code, ' ') + ',' + COALESCE(price_run_type, ' ')
               FROM 1200_tolerance
               where effective_date <= '20210308'
               group by pcontrol_code, entity_code, COALESCE(conditional_text, ' '), COALESCE(category_code,
' '), COALESCE(price_run_type, ' '))
order by pcontrol_code, effective_date, entity_code, price_run_type, category_code, tolerance_value
-- tolerance level lookup
select * from t600_lookup where lookup_type_id = 401 or lookup_id=401
```

references

Configuration using bricks

Tolerance Lookups

Top Down Exceptions IA

NAV Stack Data Model

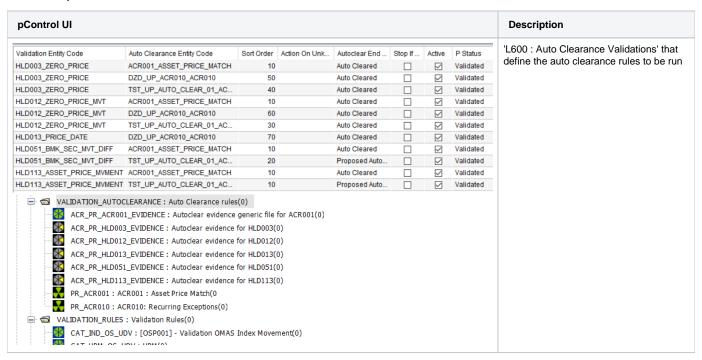
Auto Clearance Rules

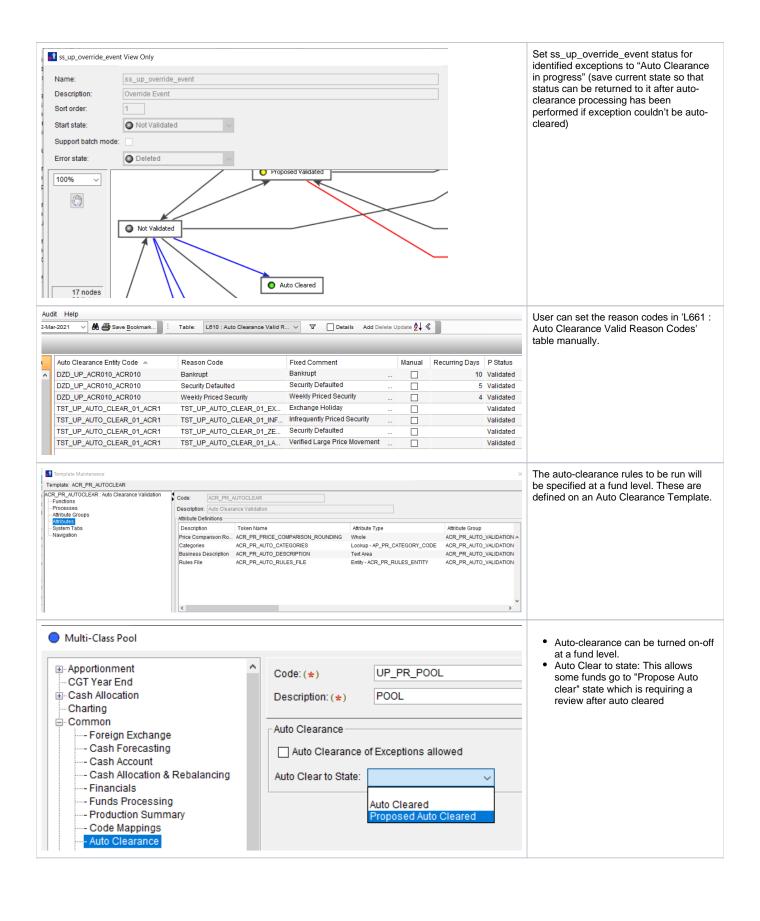
- it will execute one or more auto clearance rules
- this will take two forms, auto validations that run at the end of the NAV Control process (synchronous auto-clearance), and robots that run across a set of funds after the NAV Control validations have run (asynchronous auto-clearance)

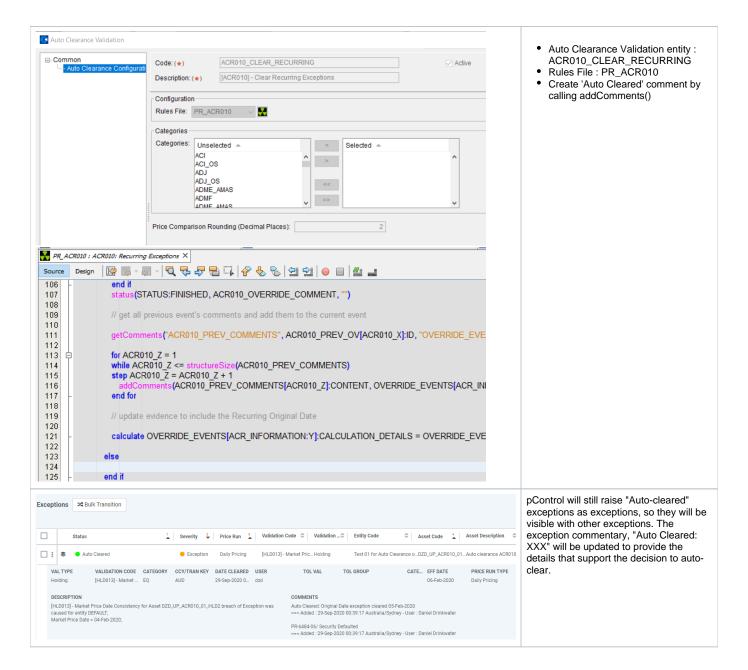
Auto Clearance Rules	Validations	Data Requirements	
ACR001: Asset Price Match	HLD003: Zero Market Price HLD012: Zero Market Price Movement HLD051: Security Price to Benchmark Movement HLD113: Asset Price Movement Check	 A03: Holding Validation (p202_holding_valid) U175: Security Prices (u175_security_prices) 	
ACR002: Defaulted Security Check	HLD003: Zero Market Price HLD012: Zero Market Price Movement HLD051: Security Price to Benchmark Movement HLD113: Asset Price Movement Check	A03: Holding Validation (p202_holding_valid) U175: Security Prices (u175_security_prices)	
ACR003: Infrequently Priced Security Check	HLD012: Zero Market Price Movement	A03: Holding Validation (p202_holding_valid) L245: Stale Price Securities (l245_stale_priced_securities)	
ACR004: Zero Price Check	HLD003: Zero Market Price	A03: Holding Validation (p202_holding_valid) U175: Security Prices (u175_security_prices) L245: Stale Price Securities (l245_stale_priced_securities)	
ACR010: Recurring Exceptions	HLD003: Zero Market Price	U?: Recurring Exception (?)	

ACR011: Dependent Validations	HLD003: Zero Market Price HLD012: Zero Market Price Movement HLD051: Security Price to Benchmark Movement HLD113: Asset Price Movement Check	 A03: Holding Validation (p202_holding_valid) U175: Security Prices (u175_security_prices) 	
ACR020: Transaction Price between high low price	TXN018: Transaction Price Differential Check	A05: Transaction Validation (p204_transaction_valid) U?: Security Market Data (?)	
ACR022: Fixed Income Sell Out	HLD004: Zero Units Check	U100: Investment Holdings (u100_investment_holdings) U113: Pending Settlements (u113_pending_settlements)	
ACR023: FX Rate	HLD005: Zero FX Rate	?	
ACR020b: Transaction within Peer Fund Range	TXN018: Transaction Price Differential Check	?	

UI example of Auto Clearance



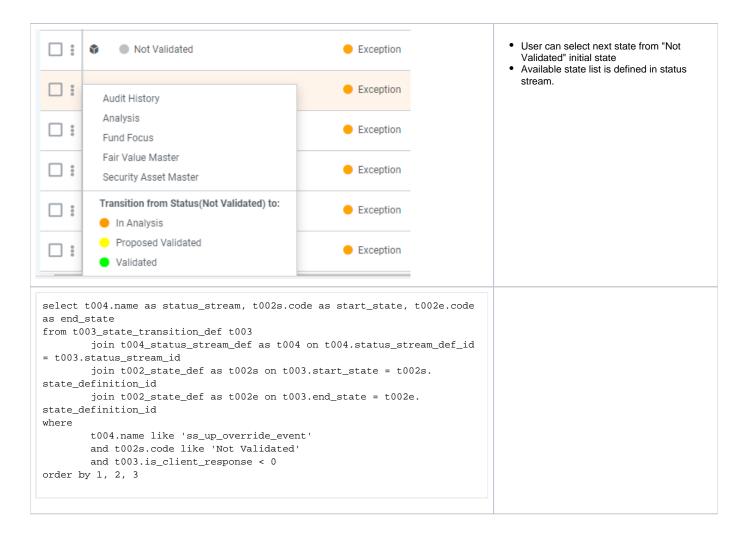




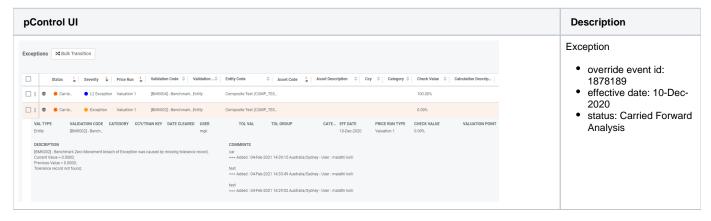
Manual Clearance

UI example of Manual Clearance

pControl UI	Description
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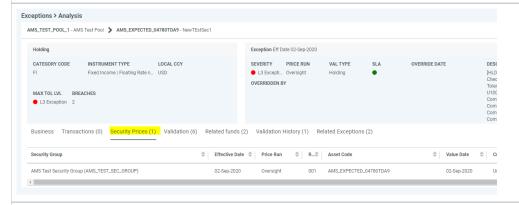


UI example of validation result



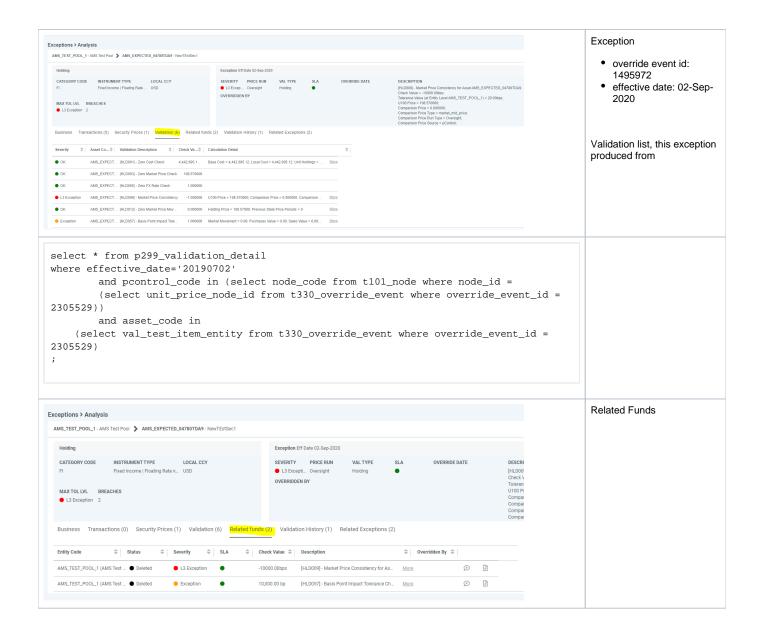
SQL

```
-- exception detail
       t330.override_event_id as id,
       t002.description as status,
       t600_401.lookup_description as severity,
       t316.description as price_run,
       t101.node_description as validation_code,
       t330.description as description,
       t330.check_value as check_value,
       t330.val_tolerance_value as tolerance_value,
        t330.unit_price_effective_date as effective_date,
        t101a.node_code as p299_pcontrol_code,
        t330.val_test_item_entity as
p299 asset code
from t330_override_event t330
       inner join t009_state as t009 on t009.business_object_id = t330.
business_object_id
        inner join t002_state_def as t002 on t002.state_definition_id = t009.
definition_id
       inner join t600_lookup as t600_401 on t600_401.lookup_id = t330.
severity_level
       inner join t316_price_run_type as t316 on t316.price_run_type_id = t330.
unit_price_price_run_type_id
       inner join t101_node as t101 on t101.node_id = t330.val_code
       inner join t101_node as t101a on t101a.node_id = t330.unit_price_node_id
where
       override_event_id =
                                  1878189
       and t600_401.lookup_type_id = 401
                                                        -- severity
-- comment
select * from t588_comment where object_id = 1878189 order by added_date_time
desc
-- validation detail data
select * from p299_validation_detail where effective_date='20201210'and
                                     pcontrol_code = 'COMP_TEST67' and asset_code = ''
```



Security Prices

```
select * from u175_security_prices where effective_date like '20200902'
    and asset_code =
    (select val_test_item_entity from t330_override_event where
    override_event_id=1495972)
```



```
select
        t101.node_code, t101.node_description, t002.description as status,
       t600_401.lookup_description as severity, t330.check_value as check_value, t330.
description as description
from t311_unit_price t311
        inner join t330_override_event as t330 on t330.unit_price_id = t311.
        inner join t101_node as t101 on t101.node_id = t311.node_id
       inner join t009_state as t009 on t009.business_object_id = t330.
business_object_id
       inner join t002_state_def as t002 on t002.state_definition_id = t009.
definition_id
       inner join t600_lookup as t600_401 on t600_401.lookup_id = t330.
severity_level
where t311.unit_price_id in
                (select unit_price_id FROM t330_override_event oe
                         oe.visible = 0
                         AND oe.val_test_item_entity in
                                        (select val_test_item_entity from
t330_override_event where override_event_id = 1495972)
                        AND oe.unit_price_effective_date = '20200902'
                group by unit_price_id)
                and t330.val_test_item_entity in
        (\verb|select val_test_item_entity from t330_override_event where override_event_id
= 1495972)
                and t600\_401.lookup\_type\_id = 401
```

Fund Signoff

UI example of fund signoff / audit

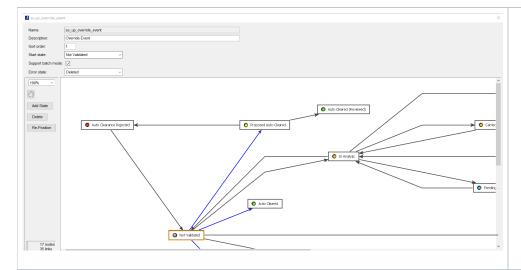
Contro	I UI					
Fund Signo	off					
	Entity	Status	Date	Price Run Type	Run ID	Ccy \$ SED
□ :	VA050 Request Process to Clos TST_AP_VA050_01_PR0D_01	Not Calculated	08-Dec-2020	Final NAV	1	United States
□:	VA050 Request Process to Clos TST_AP_VA050_01_PROD_01	Exceptions	08-Dec-2020	Tech Pricing	1	United States
□ :	VA050 Request Process to Clos TST_AP_VA050_01_PROD_02	Exceptions	08-Dec-2020	Tech Pricing	1	United States
□ :	VA050 Request Process to Clos TST_AP_VA050_02_PROD_01	Not Calculated	08-Dec-2020	Final NAV	1	United States
□ :	VA050 Request Process to Clos TST_AP_VA050_02_PROD_01	Not Released	08-Dec-2020	Pre NAV	1	United States
	VA050 Request Process to Clos TST_AP_VA050_02_PROD_01	Exceptions	08-Dec-2020	Tech Pricing	1	United States
□ :	VA050 Request to Close - Active TST_AP_VA050_02_PROD_02	Not Released	08-Dec-2020	Pre NAV	1	United States
□ :	VA050 Request to Close - Active TST_AP_VA050_02_PROD_02	Exceptions	08-Dec-2020	Tech Pricing	1	United States
4						

SQL select t311.unit_price_id, t311.business_object_id, t101.node_description, t101.node_code, t002.description as status1, t311.unitp_status_type_id, t645.unitp_status_type_description status2 from t311_unit_price t311 inner join t009_state as t009 on t009.business_object_id = t311. business_object_id inner join t002_state_def as t002 on t002.state_definition_id = t009. definition_id inner join t004_status_stream_def as t004 on t004.status_stream_def_id = t009.stream_def_id and t004.name like 'ss_up_price_approval' inner join t101_node as t101 on t101.node_id = t311.node_id and t101. node_type_id = 12 inner join t316_price_run_type as t316 on t316.price_run_type_id = t311. price_run_type_id inner join t645_unitp_status_type t645 on t645.unitp_status_type_id = t311. unitp_status_type_id WHERE t311.effective_date = TO_DATE('2020-12-08','YYYY-MM-DD') AND t311.unitp_status_type_id <> 5 -- deleted ORDER BY t101.node_code, t311.effective_date, t316.description Actions Configure Data Functions Processing Tools Audit Help · Audit history for ∨ Maa Save Bookmark... unit_price_id=405352 Audit type (lookup_type_id=86) Entities ∨ □ ₽ Id Date Modified Change Description Action Type asset="USD" **₽** assetcode="USD" attachmenticonname="empty.gif" . Manual Audit_Test: T authoriseddate=" COLLATERAL businessobject=" commenticonname="empty.gif" MG_AA: Milesto custom1=" MG_OS: Milesto custom2= custom3=" ⊞ M QA: QA GROUP custom4=" REG_TEST: Sa custom5=" custom6= custom7= ZZZ_DELETE: custom8=" custom9= effectivedate="08-Dec-2020" effectivefromdate="08-Dec-2020" id="405352" 405352 sxc 01-Feb-2021 10:05:54 INSERT integrityVersion="-1" narrative=" pricebasis= pricedatetime= pricelevel=" priceprovider=' priceruntype="Tech Pricing" prices="fl" processentitycode="TST_AP_VA050_01_PROD_01" processentitydesc="VA050 Request Process to Close - In rundate="08-Dec-2020" runid="1" status="Not approved"

Status Stream

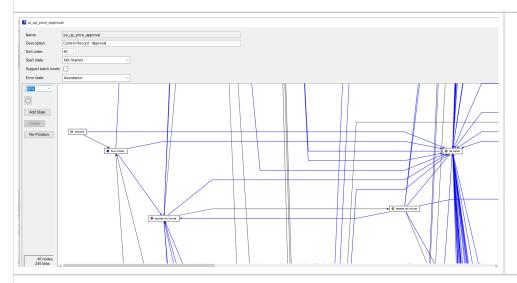
pControl UI	Description
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select * from t950_audit_log where audit_type_id=21 and id = 405352



- Status Stream name :
- ss_up_override_event
- This is the 'status' of the exception event and represents the stage of the exception lifecycle.
- Not Validated : start state
- Deleted : error state

select * from t002_state_def where status_stream_id in
(select status_stream_def_id from t004_status_stream_def where name like 'ss_up_override_event')



- Status Stream name : ss_up_price_approval
- This is the 'status' of the control record and represents the stage of the unit price lifecycle.
- Not Started : start state
- Assistance : error state

select * from t002_state_def where status_stream_id in
(select status_stream_def_id from t004_status_stream_def where name like 'ss_up_price_approval')

references

ALV, NMA and MDV Documentation

Unit Pricing User Guide