UK
Civil Aviation
Authority

CAA NR23 Price Control Model: User Guide

CAP2597f
Model Version: CAA NERL PCM Provisional Decisions_10h - v1.00

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Contents

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Chapter 1
Overview

All screenshots in this document are included for illustrative purposes only. The numbers displayed are the result of test data and should not be relied upon. They do not reflect any assumptions that CAA has made as part of setting price controls for NR23.

Background

1.1   As part of its regulatory role, the Civil Aviation Authority (CAA) is responsible for the economic regulation of the NATS (En Route) Plc (NERL). The business plan for the NR23 price control review is supported by an excel based financial model.

1.2   For the previous, RP3 price control review, the financial model used was prepared by NATS and was based upon its internally developed financial model for business planning. In addition to the NATS financial model, for RP3 there were supporting spreadsheets prepared for calculating the tax uplift for pre-tax WACC, INEA (EU Funding) and revenue from the MoD FMARS contract. The CAA also used the financial model to aid the population of European Commission reporting tables and summary tables for its reports supporting its decision on price controls.

1.3   The CAA has developed a new Excel based Price Control Model (PCM) to be used to inform the price controls for NERL for the NR23 period which will cover the UK En-route (UKATS including London approach) price control, Oceanic (North Atlantic and Tango regions) (the **Model**). This Model has focussed on the specific requirements for regulatory policy which should make it easier to manipulate for the purposes of evaluating price controls than the previous modelling approach used for RP3.

User Guide

1.4   This document (the **User Guide**) sits alongside the **Model**, providing guidance on the macro-enabled version of the Model, covering:

- Model structure;

- Operating the model; and

- Key calculations.

1.5   The user guide may reference additional documents published alongside the **Model** and the **User Guide** as part of the CAAs provisional decision for the NR23 price control.

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1.6   Please note that the Model is built in Microsoft® Excel® for Microsoft 365 MSO (Version 2112 Build 16.0.14729.20224) 32-bit. Please ensure that the macros are enabled when opening the Model if the enable macro pop up appears when Excel is opened.

Figure 1: Prompt to Enable Macros
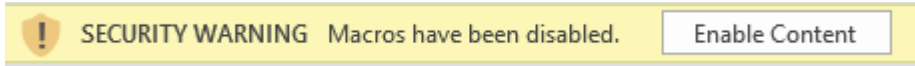
Source: PCM

Model Purpose

1.7   The Model can be used to calculate and support the selection of appropriate regulatory price controls for charges paid by users of air traffic control services for the UKATS, London Approach and Oceanic regions. In addition, the Model can be used to assess the affordability and financeability of NERL under different scenarios for forecast activity and costs (the **Purpose**).

1.8   The **Model** can also be used to populate CAA performance plan tables, including:

- determined costs and building blocks;

- adjustments and final allowed revenues;

- price profile, and

- equity and debt financeability metrics/ratios.

1.9   Further, the **Model** can:

- allow assessment of policy options in respect of traffic risk sharing and incentives; and

- provide the CAA with an analytical tool for stress testing the regulatory price controls in the NR23 price review.

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Chapter 2
Model Structure

Overview

2.1   The model logic flows (in so far as feasible) from left to right between worksheets. Calculations may occasionally require logic to flow from right to left, but, this will be the exception to the general principle.

2.2   Worksheets are clearly identified as serving one of five purposes (below), indicated by the section divider in brackets:

- **Model guidance** (**Guidance >**) – introduction to the model, version control, model map, cell legend, and worksheet descriptions;

- **Control** (**Control >**) – scenario definition, macro buttons to solve the model / store outputs, summary of checks, macro storage;

- **Inputs** (**Inputs >**) – time-based and non-time based input sheets referenced by the model's calculations;

- **Calculations** (**Calcs >**) – calculations to support price determination calculations and ratio analysis; and

- **Outputs** (**Outputs >**) – outputs of the financial model, including financial statements, Regulatory Asset Base (RAB), and dashboard metrics.

2.3   The model includes a timeline covering the period from 1 January 2015 to 31 December 2050, and contains 58 worksheets.

2.4   The model is supplied with historic (actual) values to populate the financial statements for the period 1 January 2015 to 31 December 2020 **(I_Actuals)**. Financial statements for the remainder of the modelled period are forecast.

2.5   Both units and the price basis of monetary values are specified throughout the model. Generally, the model presents monetary values in £, CPI 2020 prices in denominations of thousands. Different units, price basis, and denominations are specified when deviating from this general presentation.

2.6   The model includes the use of Visual Basic for Excel (macros) to solve for inherent circularities in calculations supporting determination of the unit price for NERL. The use of Macros are detailed below.

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Basic Guidance

2.7   Worksheet names are defined in a way to identify and separate between inputs, calculations, and outputs. Worksheet names are prefixed with ('I_' for inputs, 'C_' for calculations, and 'O_' for outputs).

   ▪ *For example:* **I_Series UKATS** *contains all time series-based inputs for UKATS.*

2.8   Yellow fill cells indicate model inputs, and blue fill cells indicate data validation (dropdown) lists for the user to select from a defined list of options. Any other cells in the model should not be updated or modified. Where there is an option of dropdown in the cell, please only use the dropdown to change the input option.

2.9   The Model provides for 10 scenarios. These are defined in the **Scenario** worksheet.

2.10   The Model operates in one of two modes: 1) Price Determination, or 2) Outturn.

   ▪ **Price Determination** uses the selected input set to calculate a price per flight for Oceanics and UKATS. Whereas;

   ▪ **Outturn mode** will use the values stored for Price Determination [for the next Control Period (e.g., NR23)] but will then recalculate values for future Control Periods. This allows the user to run sensitivities to assess the impact of different assumptions compared to those selected for Price Determination.

2.11   A summary table is presented at the top of each worksheet, which shows:

Figure 2: Scenario Manager

Scenario 2 : Base - Flat	Checks & Alerts	Ok
Live Input Set		1
Input Set for Price Determination		1
Model mode		Price Determination

Source: CAA PCM

   ▪ The live scenario modelled;

   ▪ Live status of defined model integrity checks and alerts;

   ○ *If "OK" there are no errors or alerts, if there are any errors this will show "Error". If there are only alerts and no errors this will show "Alert";*

   ▪ Model mode (Price Determination or Outturn);

   ▪ Input set selected for Outturn; and

   ▪ Input set for price determination.

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Model Map

A model map is included within the **Map** worksheet, containing hyperlinks to cell A1 of each worksheet. This allows the user to navigate to each section of the model.

Figure 3: Model Map
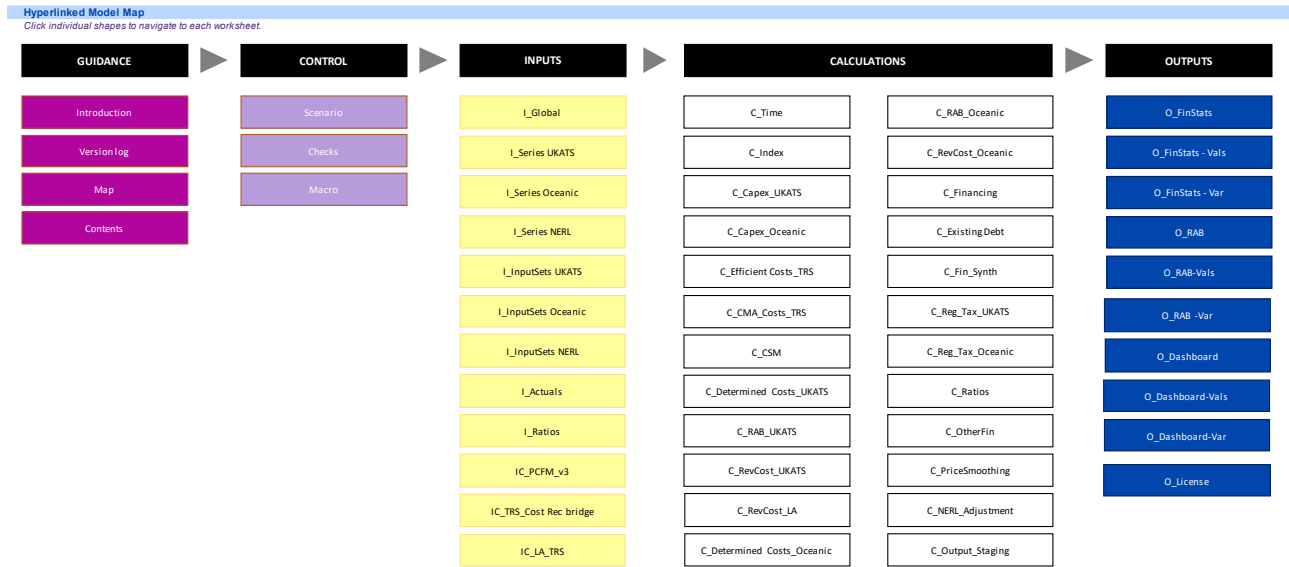
Source: PCM

Cell Legend

2.12   The model contains several defined cell styles to represent the information contained within individual cells.

2.13   The model key for these cell styles is shown in Figure 4.

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Figure 4: Model Key

Title	*Workbook Title*		
Heading 1	*Sheet Heading*	Output	*Output to different sheet*
Heading 2	*Sub Heading level 2*	Macro	*Macro*
Heading 3	*Sub Heading level 3*	Inactive	*Deliberately blank cells*
Heading 4	*Sub Heading level 4*	Named Range	*Named Range*
Time Line	*Timeline cells*	*Explanatory Text*	*Instructions & Explanations*
Section Split	*Section split in calculation worksheets*	**Warning Text**	*warning text*
Calculation	*Cells containing calculations*	Check Cell	*Check cell indicating no error*
Sub Total	*Cells containing sub totals*	Note	*Modeller notes*
Total	*Cells containing totals*	Percent	*Excel defined number format*
Linked Cell	*Cells containing links to other cells without applying calculations*	Currency	*Excel defined number format*
Input	*Input cells for user inputs*	Comma	*Excel defined number format*
Data Validated Input	*Input cells for user inputs*	Normal	*Normal*

Source: PCM

Macros

2.14   The Model includes four Macros to solve for inherent circularities in the price control calculation and applied for efficiency around storing inputs.

 ▪ *For example; Working Capital Movements in the RAB → Regulatory Return → Determined Costs → Working Capital → Working Capital Movements in the RAB.*

2.15   Each macro is located on the **Scenario** worksheet:

 1. **Full Solve Model** - Cycles through all scenarios and recalculates tax, working capital, prices, and gearing.

 2. **Optimise for Current Scenario** - Run the currently selected scenario, recalculated tax, working capital, prices, and gearing.

 3. **Smooth Current Prices only** - Calculates the required price smoothing adjustment to TRS income, for the active scenario.

 4. **Store Fin Stats** - Pastes the active scenario (**O_FinStats**) into **O_FinStats-Vals** for comparison in **O_FinStats-Var.**

 5. **Store Dashboard** - Pastes the active scenario (**O_Dashboard**) into **O_Dashboard-Vals** for comparison in **O_Dashboard-Var.**

 6. **Store RAB** - Pastes the active scenario (**O_RAB**) into **O_RAB-Vals** for comparison in **O_RAB-Var.**

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2.16   When any inputs / assumptions are changed, in Price Determination or Outturn modes, either the "Full Solve Model" or "Optimise for Current Scenario" macro should be run to recalculate the regulated charges that apply in each Price Control Period.

Model Guidance and Control

Guidance

Guidance worksheets provide qualitative information about the model and assist users in their understanding and navigation. This includes: Introduction, Version Log, Map, and Contents worksheets.

2.17   **Introduction** - covering note and disclaimer.

2.18   **Version Log** - provides key information to the user on the active model checks and alerts, live scenario, model mode, key metrics, and timestamp detailing when the Model was last solved using either "Full solve" or "Optimise for current scenario" VBA routines.

2.19   **Map** – provides a hyperlink to cell A1 of each worksheet, organised by worksheet purpose.

2.20   **Contents** - lists each model worksheet (with a short description), model cell colour key, and glossary of key terms within the model.

Control

"Control" contains the **Scenario** worksheet used to operate the model, including the model's defined scenarios, macro buttons to operate solve/storage functionality. This section also includes a summary of the model's integrity checks, and stored line items from the 'full solve' and 'optimise for current scenario' macros.

2.21   **Scenario** – Contains the model controls and scenario definition for the 10 scenarios. Scenarios may be switched on/off using the dropdown in **Col:O**.

- Under the "Model Controls" subheading, are the macro buttons to assist 'solving' the live model, or 'storing' its outputs. A short description is adjacent, along with a worksheet specific location, should the user choose not to return to the "Scenario" worksheet to activate this.

- Under the "Scenario Selector" subheading, the user may use dropdown selections to:

    o   Select the live model mode as either Price Determination, or Outturn (named range **Model_Mode**);

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- ○ Set the live scenario modelled from scenario 1 to 10 (named range **Live_scenario**); and for each scenario:

  - ▪ Define the input set in use to determine prices, or for outturn financial statements and ratios;

  - ▪ Use 'goal-seek' or 'profiled' gearing;

  - ▪ Include (or exclude) regulatory tax in determined costs; and

  - ▪ Produce profiled unit rates ('Flat Prices') or unprofiled unit rates ('Unprofiled Prices').

2.22   **Checks** - Contains a summary of the model's integrity checks, alerts, and active overrides for the live scenario.

- ▪ Checks test the logical integrity of the model, and they should always be in 'ok' status. Any exceptions to this should be investigated.

- ▪ Alerts are warnings to the user to check certain areas of the model, such as if a ratio threshold is breached for the current scenario. Alerts are not necessarily errors.

- ▪ A summary of the checks, alerts and overrides status is included in the scenario manager header at the top of each worksheet.

2.23   **Macro** - Contains stored outputs of individual line items for each of the 10 scenarios, which are stored using VBA.

- ▪ This was developed to enable 'Outturn' mode, which uses stored outputs from 'Price Determination'. The worksheet also provides a repository of outputs for each of the ten scenarios – for reference.

- ▪ It should be noted that certain calculations may be performed multiple times (iterative) to ensure that the live values calculated by the model are within the defined tolerance level to the stored values used by areas of the price determination calculation.

  - ○ *For example; working capital, which is stored to avoid inherent circularities to the price determined.*

  - ○ Model check tolerances, and alert value tolerances are defined in **I_Global**, and can be identified by the name ranges: **CheckTOL** and **AlertValueTOL.**

- ▪ The worksheet header on **Macro** maintains a live counter for this (**rLiveIteration**), alongside a maximum number of iterations which may be run (**rMaxIteration**) to ensure the model is not solving perpetually. A timestamp is included to inform the user when the model was last solved (**rTimestamp**).

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Inputs

Input sheets (prefixed "I_") are where users are required to enter information which is then used to drive the rest of the model. Input worksheet tabs are shaded in yellow. Following standard model convention, they appear after model guidance and control sheets and before calculations.

2.24   Inputs are captured across 12 specifically identified sheets, with separate inputs for:

1. Oceanic; and

2. UKATS (including London Approach).

2.25   The Model contains the functionality to allow users to easily select between different input sets.

2.26   Global (**I_Global**) and actual (**I_Actual**) inputs will not change between each scenario, however the remaining input worksheets may change for each scenario modelled.

2.27   Input sheets are structured in two formats:

▪ **Non-Time Based** – constant (or non-profiled) input assumptions. IE; a selection option for which traffic forecast to use. Often these are denoted as "I_InputSets_[xx]".

▪ **Time Based** – (profiled) inputs for a specific period within the modelled timeline. IE; the traffic inputs selected, for each model period. Often these are denoted as "I_Series_[xx]".

Non-Time Based Inputs

2.28   **I_Global** - This sheet contains static inputs which are not subject to change between scenarios. These include the Model start date, the dates for price control periods, model labels, and FHCIP/HCIP base years. The following subsections are of note to the user:

▪ **1.a Model technical inputs** – includes user defined tolerance and check alert levels.

▪ **1.s Finance Solving Macro Labels** – the named range **rSolveforPCPeriod** contains dropdown selections for each price control period. A selection of "Yes" will solve Gearing via the model solve macro (excluding actual periods).

▪ **1.w Regulatory Tax Controls** – details individual elements included/excluded from the UKATS and Oceanic regulatory tax calculations. These tax methodology selections are referenced by the **C_RegTax_UKATS** and **C_Reg_Tax_Oceanic** worksheets.

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- **1.t Smoothing Mode** – the price control period in which smoothing is applied from can be controlled from the Smoothing Period selection.

2.29   **I_InputSets UKATS** - allows UKATS profiles entered in the I_Series input sheets to be allocated to input sets. It also allows non-profiled inputs (such as Capex project allocation) to be assigned to input sets.

- It is important to note that if input sets in columns AB to AJ are empty, then the values entered in column AA will be used as a default.

- The user may override the defined input set for the live scenario using the Override field in **Col:Y**. The number of active overrides in this input set is shown in the worksheet header.

2.30   **I_InputSets Oceanic** - allows Oceanic profiles entered in the I_Series input sheets to be allocated to input sets. It also allows non-profiled inputs (such as Capex project allocation) to be assigned to input sets.

- This input set follows the structure of **I_InputSets UKATS**, and the previous guidance around empty input ranges and model overrides are also applicable.

2.31   **I_InputSets NERL** - allows NERL level profiles entered in the I_Series input sheets to be allocated to input sets. It also allows non-profiled inputs (such as the RCF commitment fee) to be assigned to input sets.

- This input set follows the structure of **I_InputSets UKATS**, and the previous guidance around empty input ranges and model overrides are also applicable.

Time Based Inputs

2.32   Time based input worksheets contain a common column use structure indicated in the 'explanatory text' notes on **Row:14**. The model's timeline begins in Col:AA throughout the workbook.

2.33   **I_Series UKATS** - contains time-based (series) inputs for UKATS (including London Approach (LA)). These include traffic forecasts, operating expenditure, profiled revenues, capex, RAB adjustments, and risk sharing parameters.

2.34   **I_Series Oceanic** - contains time-based (series) inputs for Oceanic. These include traffic forecasts, operating expenditure, profiled revenues, capex, RAB adjustments, and risk sharing parameters.

2.35   **I_Series NERL** - contains time-based (series) inputs not directly applicable to the UKATS, LA and Oceanic airspaces. This includes general indexation, financing assumptions, taxation inputs and working capital assumptions.

2.36   **I_Actuals** - allows historical "actual" inputs (for time periods with have occurred) to be entered. This allows the user to populate historical Profit and Loss, Balance

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Sheets and Cashflows, as well as to enter additional historical data required by the Model.

- The Model is populated with actual values to support the three financial statements from 1 January 2015 to 31 December 2020.

- It should be noted that if actual inputs are populated for subsequent periods, the forecast period start date **I_Global!F25** should be reviewed to ensure that the latest actual inputs are used throughout the model.

2.37   **I_Ratios** - allows users to enter values required for Ratio calculations.

- Credit rating thresholds for financial ratios may be selected via the dropdown list in **I_Ratios!F34.**

- The model contains four options to calculate the gearing metric used by the model (discussed <u>here</u>). The live gearing metric can be selected via the dropdown list in **I_Ratios!F70.**

2.38   **IC_PCFM_v3** - As part of the reconciliation between RP3 and NR23, NERL included a number of adjustments to arrive at the efficient cost baseline to be recovered. This worksheet contains input values to calculate cost reconciliation entries as part of the CAA view of the TRS Cost Reconciliation Adjustment.

2.39   **IC_TRS_Cost Rec bridge** - contains two components. The "left-hand" section from B1 to U74 contains information prepared and supplied by NERL. This information shows how the variance between the Competition and Markets Authority (CMA) costs and the NERL costs produces an adjustment that is recorded in the TRS Debtor. The "right-hand" side of this worksheet contains parallel calculations which outline the CAA view of these calculations and their values. It is important to note that none of the calculations included on this worksheet are used in the model, and the sheet serves to present values calculated by the model in a manner that is easily comparable to NERL's. As such, this sheet should be considered an aid to understanding the TRS mechanisms, rather than a pure calculation sheet.

2.40   **IC_LA_TRS** - contains inputs and calculations used for TRS adjustment for London Approach.

Calculations

Calculations are performed within the Calculation Sheets (prefixed, "C_"). Users are not expected to update these sheets as calculations will update automatically when inputs are changed in the Input worksheets. These worksheets are shaded white. Following standard model convention, they appear after the model's inputs, but before outputs.

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2.41   Calculation worksheets often focus on individual areas of the price determination and supporting calculations for ease of reference. Worksheets may also distinguish between UKATS and Oceanic calculations.

2.42   It should be noted that the worksheet descriptions below have been grouped where a similar worksheet structure / purpose is included for both UKATS and Oceanic, and may not necessarily reflect the order of the worksheets as presented in the model.

2.43   **C_Time** - contains calculations for: the model's timeline and pricing control periods, including timing flags, model start date and model end date.

- These calculations are based on global inputs populated within **I_Global**.

2.44   **C_Index** - contains calculations for the model's indexation. The Model allows for three indexation sets, including: RPI (within year growth, annual average), and CPI (within year growth, annual average). This worksheet also contains;

- Rebasing calculations to adjust between Model start date and price base.

- HICP (harmonised index of consumer prices) which is input based and forecast HICP which is a forward-looking input.

- Indexation assignment (UKATS and Oceanic) to key calculations including RAB, determined costs, revenue etc.

2.45   **C_Capex_UKATS**, **C_Capex_Oceanic** – the model allows for twenty capex projects as model inputs. Allowed cash flows from each project are allocated to (one of ten) asset categories in this sheet, to calculate accounting depreciation on these categories.

- Functionality for disposals (proceeds) and deferred income from grants and other contributions is also available at the bottom of these sheets but is not actively in use.

- Note: asset category allocations should total to 100% for each capex project. This integrity check is included within the **I_InputSets UKATS** and **I_InputSets Oceanic** worksheets.

2.46   **C_Efficient Costs_TRS** - contains calculations used to drive the CMA TRS adjustment for the years 2020 to 2022. It consolidates the selected <u>CAA Efficient Cost</u> inputs and applies indexation based on the assignment in **C_Index**.

- It should be noted that this worksheet is distinct from determined cost worksheets in two respects:

    i.   Calculations are performed for the year 2020, which is treated as a historic period elsewhere in the model, and;

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ii. The Regulatory Return and Regulatory Depreciation values are assumed as inputs and are not calculated elsewhere in the model.

2.47 **C_CMA_Costs_TRS** - contains calculations used to drive the CMA TRS adjustment for the years 2020 to 2022. It consolidates the selected <u>CMA Efficient Cost</u> inputs and applies a selected indexation.

▪ It is important to note that the price base for most of the inputs used on this sheet are in 2017 prices (different to the convention used elsewhere in the model, which is to use a 2020 price base).

2.48 **C_CSM** - contains inputs and calculations for the Cost Sharing Mechanism (CSM).

▪ The worksheet is structured by pricing control period, calculating final returns (after reallocation) from RP1 to RP3.

2.49 **C_Determined Costs_UKATS**, **C_Determined Costs_Oceanic** - calculates Determined Costs and the prices charge by TSU for UKATS and Oceanic. A summary is presented at the top of each worksheet.

▪ Note: calculations receive information from worksheets later in the model (worksheets to the right of C_Determined Costs), including: C_RAB, C_RevCost, and C_RegTax, for UKATS and Oceanic respectively.

▪ This is to include elements in determined costs which are calculated later in the model, including: regulatory return and regulatory depreciation from the RAB, Forecast TSUs for Price Determination, and grossed up corporation tax.

2.50 **C_RAB_UKATS**, **C_RAB_Oceanic** - applies the RAB rules to calculate the movement in the RAB for UKATS and Oceanic.

▪ RAB worksheets include two RABs (RAB 1, and RAB 2) the latter is not in active use and is included for functionality only.

2.51 **C_RevCost_UKATS**, **C_RevCost_Oceanic**, **C_RevCost_LA** - calculates revenue and associated working capital movements.

▪ The revenue summary shown at the top of each worksheet includes both forecast regulatory revenues (determined cost revenues (calculated from the determined cost unit rate, from **C_Determined Costs**) alongside additional revenue adjustments from the license) and the regulated revenues charged in year, after adjusting for differences between actual and forecast traffic.

▪ These worksheets include key calculations for the model's Traffic Risk Share (TRS) mechanism, and working capital calculations, alongside the separation of RP3 TRS revenues from the working capital calculations – to present them separately in the UKATS RAB.

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2.52   **C_Financing** - contains calculations relating to financing, including calculations for new debt, the revolving credit facility (RCF) and finance lease entries.

- The revolving credit facility is based on an average drawdown balance. Interest is charged on the average drawn balance while a commitment fee is charged on the average unused balance.

- **C_Financing** includes the model's gearing calculations under the "Post 2020 Debt" subsection. Gearing is calculated by goal-seeking the drawdown required to meet the selected gearing methodology.

- This worksheet also includes calculations for: interest on cash balance, interest expense for a notional company, and preparatory line items for the model's cash flow statements towards the bottom of the worksheet.

2.53   **C_Existing Debt** - contains calculations relating to the profiling of existing debt (pre-2020) and existing swaps.

2.54   **C_Fin_Synth** - contains calculations to forecast a synthetic index linked debt, including: drawdowns, repayments, and interest expense/payment. The model also included calculations for the accretion of the synthetic index linked debt.

- It should be noted that whilst the functionality to model a synthetic index linked debt balance, this is not used for the NR23 price control.

2.55   **C_Reg_Tax_UKATS**, **C_Reg_Tax_Oceanic** - calculates the Regulatory Tax associated with UKATS and Oceanic.

- Each worksheet is structured to include reconciling values (reflecting options selected for the regulatory tax controls), before moving to capital allowances and allocations between different pools.

- The model's approach to Regulatory Tax calculations are described further, here.

2.56   **C_Ratios** - contains calculations for financeability ratios.

- These include ratios by credit rating agency Moody's which include: Moody's Adjusted Net Debt to RAB, Adjusted Interest Cover Ratio (AICR), Adjusted Funds From Operation (FFO) to Net Debt, Adjusted FFO to Net Interest, and RCF / Net Debt.

- Other ratios included, are: EBITDA Margin, FFO Interest Cover, Net Debt to Earnings Before Interest, Tax, Depreciation and Amortisation (EBITDA), and Equity Internal Rate of Return (IRR).

2.57   **C_OtherFin** - contains miscellaneous calculations such as the profiling of non-current assets, other liabilities, movement in pension asset values, and calculations for the model's dashboard (**O_Dashboard**).

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2.58   **C_PriceSmoothing** – the Model contains the option to calculate either 'Flat' or 'Unprofiled' unit prices, for the specified price control period. This worksheet contains calculations associated with the Price Smoothing logic for: UKATS, Oceanic, and London Approach.

- The user should note that the price smoothing logic has been setup to consider existing unit prices which are currently charged during the NR23 period (for the year 2023).

- Therefore, the overall adjustment to achieve 'smooth flat' prices, considers both 1) the adjustment required to set the forecast 2023 unit price equal to the defined 2023 input unit rate, and 2) adjustments for future years to achieve smooth prices over the remainder of the price control period.

- Integrity checks including the named range (**r_Flat_var**) have been included to ensure that the present value of the unprofiled prices are equal to the profiled prices calculated within the model, via a Goal-seek VBA routine.

2.59   **C_NERL_Adjustment** - calculates the value of the RP3 TRS balance which NERL have included in their RAB.

- A policy decision was taken by the CAA to transfer this balance to the TRS Debtor, where the final value of this worksheet is exported to.

  ○ Note: the user may instead add this adjustment to the RAB via the dropdown selection in **I_Global!F376**. By default, this should be set to "Add to TRS".

2.60   **C_Output_Staging** - summaries the model's calculations and prepares them for display in the output sheets. The calculations are divided into sections at the:

- UKATS, Oceanic, and total NERL level; alongside summaries for:

  ○ Eurocontrol reporting: UKATS_T1 ANSP, LA_T1 and T2 ANSP; and

  ○ Performance Plans: UKATS, Oceanic, and London.

Outputs

Output sheets (prefixed, "O_") store key financial information which is expected to be of most interest to users, such as financial statements and dashboards. Users are not expected to update these sheets. Following standard convention, they are in worksheets to the right of the model.

2.61   **O_FinStats** – contains live outputs for the Income Statement, Balance Sheet, and Cash Flow Statement.

- Below the three statements are: checks and alerts for the financial statements, regulatory ratios, determined price, equity IRR and return on regulatory equity (RORE), and calculated unit rate.

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▪ The live outputs of the financial statements can be frozen using the "Store FinStats" macro included on the **Scenario** worksheet, which stores the live values in **O_FinStats – Vals**.

2.62   **O_FinStats – Vals** - contains stored values for the three financial statements. These values are stored via the "Store FinStats" button located on the **Scenario** worksheet.

2.63   **O_FinStats – Var** – is a comparison worksheet, highlighting any differences between the live financial statements and the stored financial statements in the O_FinStats worksheets.

2.64   **O_RAB** - contains a summary of the RAB for UKATS, Oceanic, alongside the combined RAB.

2.65   **O_RAB – Vals** - contains stored values for the RAB for UKATS, Oceanic and the combined RAB. These values are stored via the "Store RAB" button located on the **Scenario** worksheet.

2.66   **O_RAB – Var** – is a comparison worksheet, highlighting any differences between the live O_RAB tab and the stored O_RAB tab in the O_RABs worksheets.

2.67   **O_Dashboard** - contains summary information and key metrics for the live scenario modelled.

▪ Flights (TSU/CSU) used to calculate the live unit rates are included at the top of this worksheet, followed by a breakdown of the determined costs and unit rates for: UKATS, Oceanic, and London Approach, in both Nominal and CPI 2020 prices.

▪ The remainder of this worksheet includes information for figures produced outside of the Model, a reconciliation bridge of the unit price, and reporting data required for Eurocontrol CRCO tables.

2.68   **O_Dashboard- Vals** - contains stored values for the live scenario modelled. These values are stored via the "Store Dashboard" button located on the **Scenario** worksheet.

2.69   **O_Dashboard- Var** – is a comparison worksheet, highlighting any differences betweenthe live scenario and the stored scenario in the O_Dashboard worksheets

Macros

The Model contains four macros. Three macros are to assist with solving areas of the model's calculations for efficiency, and one macro is included to freeze the live model's results for performing scenario comparisons. All macros included in the Model can be

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operated from the buttons located on the **Scenario** worksheet, under the Model Controls subheading.

Table 1: Macros in the CAA PCM

Macro name	Description	Use
Full Solve Macro	Cycles through <u>all scenarios</u> and recalculates tax, working capital, prices, and gearing, based on the scenario options defined on the **Scenario** worksheet. Values stored by the Macro are populated on the **Macro** worksheet.	Solves <u>all</u> scenarios (marked as "On" in **Col:G, Scenario**), storing results for both Price Determination and Outturn modes. This allows the user to: ▪ compare the outputs generated by different scenarios; and ▪ for "Outturn" scenarios to be run.
Optimise for Single Scenario	Functions as **"Full Solve Macro"** above, but only solves the model for the currently selected scenario.	As above, but for the live scenario and model mode selected. This macro functions irrespective to being marked as either "On" or "Off" in the scenario selector.
Smooth Current Prices Only	Calculates the required price smoothing adjustment to TRS income, for the active scenario.	For re-calculating "smooth" unit prices for the active scenario only, without re-solving other areas of the Model.
Store Fin Stats	Pastes the active scenario (**O_FinStats**) into **O_FinStats-Vals** for comparison in **O_FinStats-Var**.	Enables a delta comparison (live vs stored) of the three main financial statements and associated metrics on **O_FinStats**.

Source: CAA

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2.70   It is important to note that either "Full Solve Macro" or "Optimise for Single Scenario" should be run when any inputs / assumptions are changed for either Price Determination or Outturn modes, to recalculate the regulated charges that apply in each Price Control Period.

Macro Selection

2.71   The table below summarises the **Macro** worksheet and stored values when re-calculating the Model to solve for circularities in the price control calculation.

2.72   Each section of the Macro worksheet includes a link to where the live calculation is performed within the Model, alongside input banks to store each of the ten available scenarios.

2.73   Where areas of the model interact with the VBA routines described (**Table 2**), these contain a pink cell colour fill, and are formatted with the cell style "Macro".

Table 2: Selection of Macro worksheet

Section of Macro worksheet	Description	Purpose
UKATS Stored Determined Cost 'Macro'!315:49	This stores the calculated Determined Cost per TSU for UKATS for each year separately for each of the ten scenarios under Price Determination inputs.	Freeze values when running stress-tests. Break the circularity that exists because the regulatory return on RAB is impacted by working capital (which is impacted by the regulated revenues).
UKATS Stored Outturn Prices 'Macro'!650:88	Like above but stores for Outturn Scenario (Selecting the Price Determination value for the next Price Control Period).	Break the circularity that exists because the regulatory return on RAB is impacted by working capital (which is impacted by the regulated revenues).
UKATS Stored CSM Price Determination 'Macro'!89:123	Stores the calculated CSM adjustment for each of the ten scenarios under Price Determination inputs.	To freeze results when running stress tests.
UKATS Stored CSM Outturn 'Macro'!124:162	Stores the calculated CSM adjustment for each of the ten scenarios under Outturn inputs (selecting	Store the results for each of the ten scenarios.

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Section of Macro worksheet	Description	Purpose
	the Price Determination value for the next Control Period).	
Oceanic Stored Base Charge (Base) **'Macro'!163:197**	This stores the calculated Determined Cost per Flight for Oceanic for each year separately for each of the ten scenarios under Price Determination inputs.	Freeze values when running stress-tests. Break the circularity that exists because the regulatory return on RAB is impacted by working capital (which is impacted by the regulated revenues).
Oceanic Stored Base Charge (Base) – Outturn **'Macro'!198:236**	Like above but stores for Outturn Scenario (Selecting the Price Determination value for the next Price Control Period.	Break the circularity that exists because the regulatory return on RAB is impacted by working capital (which is impacted by the regulated revenues).
Oceanic Stored ADS-B Atlantic Charge **'Macro'!237:271**	This stores the calculated ADS-B (Atlantic) cost per Flight for Oceanic for each year separately for each of the ten scenarios under Price Determination inputs.	To freeze results when running stress tests.
Oceanic Stored ADS-B Atlantic Charge – Outturn **'Macro'!2872:309**	Like above but stores for Outturn Scenario (Selecting the Price Determination value for the next Price Control Period.	Store the results for each of the ten scenarios.
Oceanic Stored Determined Cost (ADS-B, Tango) **'Macro'!310:344**	This stores the calculated ADS-B (Tango) cost per Flight for Oceanic for each year separately for each of the ten scenarios under Price Determination inputs.	To freeze results when running stress tests.
Oceanic Stored Determined Cost (ADS-	Like above but stores for Outturn Scenario	Store the results for each of the ten scenarios.

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Section of Macro worksheet	Description	Purpose
B, Tango) Outturn **'Macro'!3645:382**	(Selecting the Price Determination value for the next Price Control Period.	
London Approach Stored Determined Cost **'Macro'!383:417**	This stores the calculated Determined cost per TSU for London Approach for each year separately for each of the ten scenarios under Price Determination inputs.	To freeze results when running stress tests.
London Approach Stored Determined Cost – Outturn **'Macro'!418:455**	Like above but stores for Outturn Scenario (Selecting the Price Determination value for the next Price Control Period.	Store the results for each of the ten scenarios.
Oceanic RAB Depreciation - Price Determination **'Macro'!456:490**	This stores the calculated Allowed Depreciation for Oceanic for each year separately for each of the ten scenarios under Price Determination inputs.	To freeze results when running stress tests.
UKATS RAB Depreciation **'Macro'!491:525**	This stores the calculated Allowed Depreciation for UKATS for each year separately for each of the ten scenarios under Price Determination inputs.	To freeze results when running stress tests.
Oceanic Depreciation Backlog **'Macro'!5426:560**	This stores the calculated Depreciation backlog for Oceanic for each year separately for each of the ten scenarios under Price Determination inputs.	To freeze results when running stress tests.
UKATS Depreciation Backlog **'Macro'!561:595**	This stores the calculated Depreciation backlog for UKATS for each year separately for each of the	To freeze results when running stress tests.

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Section of Macro worksheet	Description	Purpose
	ten scenarios under Price Determination inputs.	
UKATS Regulatory Return - Price Determination **'Macro'!596:630**	This stores the calculated Regulatory Return for UKATS for each year separately for each of the ten scenarios under Price Determination inputs.	To freeze results when running stress tests.
UKATS Stored Determined Cost **'Macro'!315:49**	This stores the calculated Determined Cost per TSU for UKATS for each year separately for each of the ten scenarios under Price Determination inputs.	Freeze values when running stress-tests. Break the circularity that exists because the regulatory return on RAB is impacted by working capital (which is impacted by the regulated revenues).
Oceanic Regulatory Return - Price Determination **'Macro'!631:666**	This stores the calculated Regulatory Return for Oceanics for each year separately for each of the ten scenarios under Price Determination inputs.	To freeze results when running stress tests.
Gearing Profile Uses **'Macro'!667:700**	This stores the Gearing profile drawdown by the model.	To preserve results between different scenarios.
Frozen Working Capital UKATS **'Macro'!701:734**	This stores the working capital used to drive the RAB.	To break a circularity when using the grossed up Regulatory Tax method.
Frozen Working Capital UKATS RAB PR3 TRS **'Macro'!735:768**	This stores the working capital for RP3 TRS used to drive the RAB.	To break a circularity when using the grossed up Regulatory Tax method.
Tax Charge (Grossed Up) UKATS **'Macro'!769:7802**	This stores the grossed up tax charge used when Regulatory Tax is selected.	To break a circularity when using the grossed up Regulatory Tax method.

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Section of Macro worksheet	Description	Purpose
Frozen Working Capital Oceanic **'Macro'!703:836**	This stores the working capital used to drive the RAB.	To break a circularity when using the grossed up Regulatory Tax method.
Tax Charge (Grossed Up) Oceanic **'Macro'!837:870**	This stores the grossed up tax charge used when Regulatory Tax is selected.	To break a circularity when using the grossed up Regulatory Tax method.

Source: CAA

2.74   In addition to the line items stored for each scenario modelled (above), the TRS release price smoothing adjustment is also recorded for each scenario within **C_PriceSmoothing!C169:C200**.

Macro Run Sequence

2.75   The "Full Solve Macro" (or "Optimise Current Scenario") buttons by default runs this sequence to solve the Price Determination calculation:

▪ It is important for the user to note this, as the sequence in which these events run is one of the assumptions underpinning the model.

Run Sequence

1. **Set variables to run a new scenario, including:**

   a) Set price profiling to use unsmoothed (unprofiled) prices;

   b) Set the model's gearing (drawdown) calculations to use live values; and

   c) Clear (set to zero in NR23) any previous drawdown profile for debt (which can otherwise impact on the regulatory tax calculation).

2. **Perform an initial solve of the price determination calculation, including:**

   a) Reset the model to "No REG Tax in DC" where there is no adjustment for Tax in calculated Determined Costs (**Scenarios**, **Col:M**);

   b) Calculates Determined Cost per flight based upon Price Determination mode assumptions; and

   c) Restore the tax mode defined for the live scenario.

3. **Perform subsequent solves of the price determination calculation until the model has converged where live calculated values, equal those stored by the VBA Routines, including:**

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a) Freeze the working capital adjustment included within the RAB;

    i) At this stage, if the tax mode selected includes regulatory tax in the determined cost calculation (named range **rTaxMode** set to "REG Tax Calculated"), the model will:

        1. Calculate grossed up tax value based upon an adjusted net debt position (which is based upon the opening cash value (from balance sheet which will be impacted by prior year drawdowns/dividends and interest) adjusted for an amended in-year cash movement). The in-year cash movement excludes interest on new debt and tax for that year but includes interest on cash balances); and

        2. Include Grossed up Tax in Determined Cost Building block (this impacts on working capital but working capital adjustment is not re-calculated).

    ii) Else, Grossed up Tax is not included in the Determined Cost Building block.

b) Recalculate Determined Costs per Flight in Price Determination mode including an allowance for Regulatory Tax;

c) Apply Price Profiling to smooth Unit Price per TSU via an adjustment to Revenue/Cash;

    i) Note: If "Unprofiled Prices" is selected for the scenario, the model will continue to calculate the temporary unit rate adjustment required for the year 2023.

d) Calculate the drawdown required to meet target dividends (Gearing).

4. **Repeat Step #3 until the model has satisfied that live calculated values are equal to stored values, or the maximum number of iterations are reached;**

a) The user may define the maximum number of iterations for the price determination calculation in the named ranged **rMaxIteration.**

5. **Store Outputs for Price Determination Mode.**

6. **Changes assumptions to those selected for Outturn mode (and re-calculates charges on an outturn basis).**

7. **Store Outputs for Outturn Mode.**

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Chapter 3
Operating the model

Setting up the Model

Global Assumptions

This covers the global inputs and assumptions used throughout the workbook, contained in the **I_Global** worksheet.

Technical Inputs

3.1 The model contains a small number of technical inputs, including:

- **Model check tolerance level** – used by the model's integrity checks to check values based on a user defined (rounding) tolerance;

- **Alert user when value exceeds** – used by the model's alerts to inform the user when a specified value exceeds the user defined tolerance value;

- **Sign switch** – used to change the sign-convention for costs/revenues throughout the model. When applied, line items are typically denoted to indicate the change in sign IE; UKATS - Corporation Tax Charge [REG] [NEG]);

- **Tolerance for Price Determination macro** – used by the model alerts when the model is set to Price Determination mode. This tolerance value checks if the "Adjustment for Working Capital Impact of change in Determined Cost" is within the defined rounding tolerance level.

Time Inputs

3.2 Under "Timings" (**I_Global!B21**) the model's start date, periodicity, and forecast start/end dates are defined.

3.3 In cell **I_Global!F28** the user may also update the year to use for "Price base for real inputs" (set to "2020" as default). Doing so will change the price base year used by the model's indexation calculations to create price indices = 1.00 for the model's base year.

- However, it should be noted that the Model does not automatically convert all monetary inputs to a common price base year, before applying indexation.

- Therefore, the user must exhibit caution when updating the "Price base for real inputs" to ensure that the inputs supplied to the model are consistent with this Global assumption.

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3.4   The license conditions specify a lag factor applicable to individual areas of the price control calculations, and may be altered by updating the cell in **I_Global!F43**.

Finance Solving Macro

3.5   **I_Global** contains part of the model's gearing controls.

3.6   The (Yes/No) option selections contained in the named range **rSolveforPCPeriod** allow the user to specify which price control periods the model's gearing macro routine will solve for.

   ▪ Note: this is applicable for "Forecast" periods only. Periods for model actuals will use the actual values instead.

Regulatory Tax Controls

3.7   The model's regulatory tax calculations have been setup to allow the user to control individual elements of the regulatory tax calculation.

3.8   The selections in Figure 5 represent options to include/exclude certain revenues, indexation, and adjustments for subsequent use in the **C_Reg_Tax_UKATS**, and **C_Reg_Tax_Oceanic** worksheets.

Figure 5: Regulatory Tax Controls

Regulatory Tax Controls

UKATS

1	Include INEA/Grant release?	No	selection
2a	Include Revenue Adjustments? (ex. TRS)	No	selection
2b	Include TRS (Base Adjustment)	No	selection
2b	Include TRS (indexation)	Yes	selection
2b	Tax indexation on TRS released? (No = on RP3 TRS Balance)	No	selection
2b	Include TRS (return)	No	selection
3	Include variance between Determined Cost/P&L Pensions	No	selection
4	Include Movement in Pension Asset	No	selection
5	Include Provisions	No	selection
6	Interest Expense = allowed cost of debt times the net debt	Yes	selection

Oceanic

1	Include Revenue Adjustments?	No	selection
2	Include variance between Determined Cost/P&L Pensions	No	selection
3	Include Grant?	No	selection
4	Include Provisions	No	selection
5	Include Other Oceanic Revenue	No	selection

Source: PCM

Cost of Equity Assumptions

3.9   The bottom of **I_Global** contains non-Modigliani–Miller assumptions for the Cost of Equity used in ratio calculations later in the model (**C_Ratios**).

3.10   These include the Equity Beta (Asset beta, Debt beta, Gearing), and Equity Risk Premium (risk free rate, total market return).

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Updating Model Inputs

This covers updating the model's existing inputs, changing input sets for scenarios, and how to use the model's overrides.

Updating Inputs

3.11   The model's input worksheets can be identified by the "**Inputs >**" section divider. Input worksheet tabs are indicated in yellow. Similarly, input cells for the user to update are indicated with a yellow cell fill colour.

3.12   Updated inputs can be used in a live scenario, by allocating the input to an input set, and setting the model scenario to use this input set.

3.13   The model has been constructed with spare input rows to accommodate different users requirements. Often, the Model provides for between 3 to 5 different inputs.

Changing Input Sets

3.14   Input sets are a combination of model inputs that allow the user to consistently select the live inputs to use in the model's calculations, based on the input set assigned to the modelled scenario.

3.15   Input sets may include a specified input constant (**Col:F**), or a selected time-series input. The Model contains three input set worksheets:

- I_InputSets UKATS;

- I_InputSets Oceanic; and

- I_InputSets NERL.

3.16   The model allows for 10 input sets, allowing each of the 10 scenarios to contain a different input set – if required.

- **Note:** If no input set is assigned for a selected input, then the "Base Case" input [Input Set 1] will be used.

3.17   Cell formatting indicates whether the user may select the input series to use (dropdown selection), or if the user may enter a user specified value for that input set. An example input set is shown below Figure 6.

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Figure 6: Example Input Set

Source: PCM

3.18   The label and description for each input set can be updated in cells **'I_InputSets UKATS'!AA4:AJ5**. Updates made to the input set labels and descriptions will be reflected automatically within the Oceanic and NERL equivalent input set worksheets.

- **Note**: Updated input set labels may need to be re-selected for individual scenarios within cells: **Scenario!H42:H51,J42:J51**, as the option selected through data validation may refer to the previous name, resulting in lookup errors elsewhere in the model on selection.

3.19   Once input sets have been specified, they may be assigned to an individual scenario, for use in either Price Determination and or Outturn Mode.

Assigning Input Sets to a Scenario

3.20   Input sets can be allocated to each of the model's scenarios within the **Scenario** worksheet, using the data validation inputs highlighted in Figure 7.

3.21   Where the input sets allocated to determine prices differ to those allocated for use in outturn mode, the nature of the Scenario will display "Stress" as opposed to "Base", indicated to the user that using the model in Outturn mode for that scenario will result in modelling a stress test.

Figure 7: Assigning Input Sets to a Scenario

Source: PCM

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Using Model Overrides

3.22   The user may override the live input set with a user specified input in the following areas of the model:

- I_InputSets UKATS;

- I_InputSets Oceanic; and

- I_InputSets NERL.

3.23   Overrides available to the user are indicated by one of two cell formats: 1) Input cells, and 2) Data Validated Inputs. Rows marked with the "Inactive" cell style are unavailable to use as modelled overrides.

3.24   A summary of the active overrides in the model can be located within: **Checks!A78**. It is important for the user to regularly review any overrides in use, to avoid producing scenarios with incumbent overrides in place, which will overwrite the active input set selected.

Figure 8: Summary of Active Overrides

Overrides:			
Input Sets			
UKATS		0	# overrides
Oceanic		0	# overrides
NERL		0	# overrides
Other			
Equity Transfer (to)/from Shareholders - Override Active?		1	1 = Yes
Total Overrides Active		1	

Source: PCM

- **Note:** Equity Transfer (to)/from Shareholders – Override Active?, indicates whether this input is in use, and is not an override field for the user to enter an input, as with the input sets above.

Checking for Errors

This covers the model's integrity checks and model alerts, for reference when operating the model.

3.25   Before using the model, the user should refer to and familiarise themselves with the Checks worksheet, which summarises the live status of the model's integrity checks and monitored alerts.

3.26   The live status of the model's checks and alerts are included in the Scenario Manager, shown in Figure 2.

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Integrity Checks

3.27   When setting up, and using the model on an ongoing basis, all integrity checks in the **Checks** sheet should display a value of "ok". Error messages should be investigated immediately, before continuing to use the model. A list of the integrity checks included in the Model are shown in Figure 9.

Figure 9: Integrity Checks included in the Model

Integrity checks:

As these checks test the logical integrity of the model they should all be in 'ok' status at all times. Any exceptions to this (Error) should be investigated.

Model Integrity Checks

FinStat (Actuals) - balances sheet checks	ok	check
FinStat (Actuals) - cash balance checks	ok	check
FinStat - balance sheet check	ok	check
FinStat - cash flow check	ok	check
Unit Price CSU = TSU	ok	check
Check - all CMA costs included?	ok	check
Check - all efficient costs included?	ok	check

Input Consistency checks

Check that Pre 2020 Debt does not result in a negative debt value	ok	check
Check: Average Drawn Balance does not exceed facility size	ok	check
Check that Finance Lease liability c/f does not go positive	ok	check
Check that Right of Use Asset c/f does not go negative	ok	check
Check UKATS - TTRS Banding inputs	ok	check
Check Oceanic - TTRS Banding inputs	ok	check
UKATS calcs - check TTRS Allocation	ok	check
Oceanic calcs - check TTRS Allocation	ok	check
LA calcs - check TTRS Allocation	ok	check
Existing Asset Capital Allowance does not go negative check	ok	check
Check that DUC (CSU-based) = DUC (TSU-based)	ok	check
Check UKATS Project Allocations total 100%	ok	check
Check Oceanic Project Allocations total 100%	ok	check
UKATS DC Import into Staging Correct	ok	check
Oceanic DC Import into Staging Correct	ok	check
Input Check - Oceanic Revenue	ok	check
Post 2020 Debt - Corkscrew Check	ok	check
Oceanic - Opening Rev. Debtor Check	ok	check
Check - Input Dividends Paid Out?	ok	check
Total capital allowance checks	ok	check
Check - Working Capital Movements (Live = Stored)	ok	check
Check - RP3 Working Capital Movements (Live = Stored)	ok	check
Check - Determined Cost Revenue (t) - Forecast Traffic (TSU) = Determined Costs	ok	check

Source: PCM

Model Alerts

3.28   Model alerts do not necessitate an error, but does notify the user of changes in the model's status which may be of interest. The alerts included in the Model are shown in Figure 10.

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Figure 10: Alerts included in the Model

Alerts:			
Debt Inputs			
Repayment Pre 2020 Debt POS	ok	alert	
Finanical Statements			
FinStat - negative shareholder funds	ok	alert	
FinStat - negative cash balance check	ok	alert	
FinStat - negative shareholder funds	ok	alert	
Macro			
Oceanic Price Determination Macro needs running	ok	alert	
UKATS Price Determination Macro needs running	ok	alert	
Ratios			
Adjusted Interest Cover Ratio alert	ok	alert	
Adjusted FFO to Net Debt alert	ok	alert	
Adjusted FFO to Net Interest alert	ok	alert	
Bridges			
Check - 2022 Unit Rate Buildup	ok	alert	*NB: If triggered, 1) checked if smoothed prices are used. Smoothed prices will break this price bridge.*
Unit price bridge check	ok	alert	*NB: If triggered, checked if smoothed prices are used. Smoothed prices will break this price bridge.*
Price Smoothing			
Price smoothing is active (and solved)	ok	alert	
Tax			
UKATS Reg Tax - Modelling Simplification within Tolerance:	ok	alert	*NB: Checks NR23 period for modelling simplification introduced to avoid circularity*
Oceanic Reg Tax - Modelling Simplification within Tolerance:	ok	alert	*NB: Checks NR23 period for modelling simplification introduced to avoid circularity*

Source: PCM

Viewing Results

3.29   The model contains three core output worksheets, summarising results from the live scenario modelled. Two additional worksheets are also included to support variance analysis for modelling different sensitivities / scenarios. The three core worksheets are:

- **O_FinStats** – Live outputs for the three financial statements;

- **O_RAB** – Summary of the RAB for UKATS, Oceanic, and Combined; and

- **O_Dashboard** – Containing summary information and output metrics.

Operating the Model

This covers how to run the model in its two modes, for single or multiple scenarios. This includes how to run a "stress test".

Model Modes

3.30   The model operates in two modes: 1) Price Determination Mode, and 2) Outturn Mode:

- **Price Determination Mode** - In Price Determination Mode, the Model will use the selected input set to calculate a price per flight for Oceanic and UKATS.

  ○ This value is exported to the **Macro** worksheet of the Model.

  ○ When the macro to calculate and store determined costs is run, values will be stored for the relevant scenario.

- **Outturn Mode -** In Outturn mode the Model will use the values stored for Price Determination for the next Control Period (e.g., NR23), but will then recalculate values for future Control Periods.

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○ This allows the user to run sensitivities to assess the impact of different assumptions compared to those selected for Price Determination.

○ The Model will recalculate inputs for subsequent control periods to reflect the expectation that any difference in costs and revenues between Price Determination and Outturn would be revisited after the next Control Period, and the Model is only intended to allow for analysis of variance between Price Determination and Outturn assumptions for the next Control Period.

○ Note: the Model will continue to use Price Determination assumptions for TSU/CSU/Flights when calculating the allowable cost per TSU/CSU/Flight in a Price Control Period.

3.31 **After any change of inputs / assumptions** in either Price Determination or Outturn modes, the macros for Price Determinations (Optimise Current Scenario, or Full solve model) should be run to recalculate the regulated charges that apply in each Price Control Period.

3.32 The live model mode can be selected in cell **Scenario!F29** (named range, Model_Mode).

Running a Scenario

Run Price Determination Mode

Steps to run Price Determination:

1. Navigate to **Scenarios** and set the Model mode to "**Price Determination**" in cell **'I_Scenarios'!F29** (named range, Model_Mode).

2. Ensure that the input sets you want to run are assigned to a scenario. Input sets are selected in **Scenario!H42:H51**.

   ▪ In **Figure 11** below, the second scenario (ID 2) is set to use the "Base Case" input sets to determine prices.

Figure 11: Scenario Selection

Source: PCM

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3.   To determine prices for the current scenario, click on the "Optimise for current scenario" button under Macro Controls (above).

- **Note:** "Full solve model" may also be used, however, this will solve the model for <u>all</u> scenarios marked as "On". Pressing "Optimise for the Current Scenario" will solve the model for the active scenario, irrespective as to whether it is marked as "On" or "Off" (named range, **rScenOnOff**).

Figure 12: Solving the Model
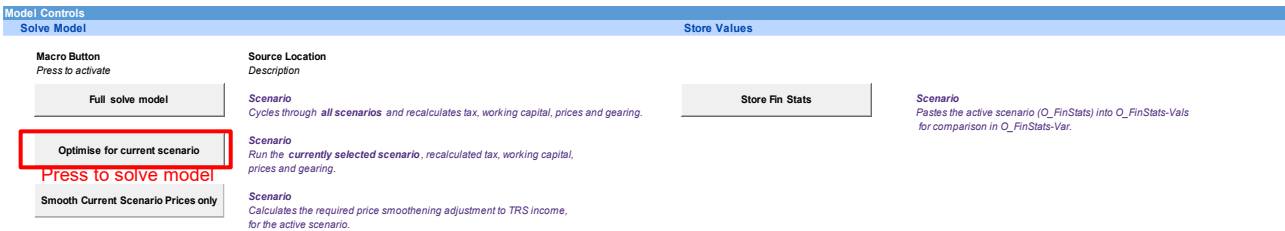
Source: PCM

4.   Whilst the VBA routine is underway, the application status bar (bottom left of the screen) will provide interim updates as the Model solves the Price Determination calculations for both Price Determination and Outturn modes.

5.   Once complete, the user will be notified a user message "VBA Script executed", confirming that the model run is now complete.

Figure 13: Running the model
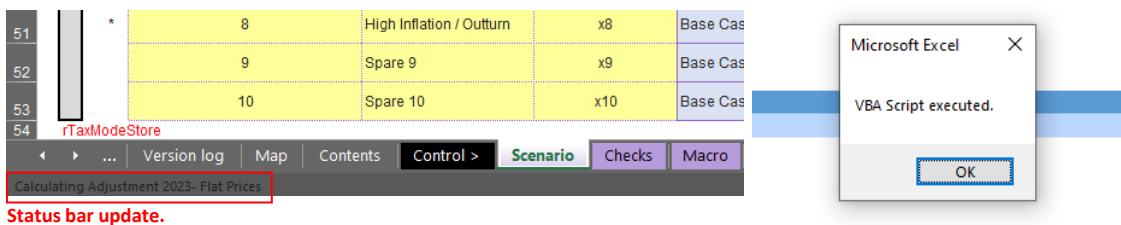
Source: PCM

Run Outturn Mode (Stress Tests)

Outturn Mode allows the user to perform "Stress cases" where assumptions differ from those used to set Price Controls. IE; if price per flight is held constant, and other inputs are flexed (such as the traffic forecast), what is the impact to the regulated entity.

3.33   The model can be used to perform stress tests, where the input sets used to determine prices (**Col:H, Scenario**) are not equal to the input sets used to determine outturn financial statements and ratios (**Col:J, Scenario**).

3.34   To perform a stress test, the Model is run in **Outturn** mode.

- The nature of each of the 10 defined scenarios is noted in **Col:L, Scenario**, and can also be interpreted when the input number in the scenario selector ("Live Input set", and "Input set for Price Determination") are <u>not</u> equal.

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3.35   Outturn mode uses values stored for Price Determination to recalculate values for future Control Periods. Therefore, **if any inputs or assumptions are changed then the Price Determination macro should be re-run** to recalculate the price controls and stored values for the revised inputs.

3.36   Whilst in **Price Determination** mode, the following alerts (**'Checks'!F55:F56**) will notify the user if a re-run of the macro is required (before using the model in outturn mode):

Figure 14: Alert – the Price Determination macro needs running

Macro
Oceanic Price Determination Macro needs running   Alert   alert
UKATS Price Determination Macro needs running   Alert   alert

Source: PCM

Steps to run outturn mode:

1.   Navigate to **Scenarios** and set the Model mode to "**Outturn**" in cell **'I_Scenarios'!F29** (named range, Model_Mode).

   ▪ Note that when the Input Set used for Price Determination is different to the Input Set used in Outturn mode, the "Nature of Scenario" column will change from "Base" to "Stress".

2.   Press F9 to recalculate (if Excel is in manual calculation mode) and the Model will now be using the Outturn values.

Running Multiple Scenarios

3.37   The Model provides for 10 scenarios, and can be run sequentially to produce up to 10 sets of outputs (if all scenarios are selected as "On" in **Col:G** in **Scenario** (named range, rScenOnOff);

   ▪ If all scenarios are marked as "Off", the user will shortly receive a VBA message prompt of "VBA Script executed", however no scenarios will have been run by the model.

3.38   To run multiple scenarios, the user should select the "Full solve model" button, noting that depending on the number of active scenarios (marked as "On") that this may take some time to solve, depending on the configuration of the scenarios defined, and the number of iterations required for the model to solve.

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Figure 15: Solving the model for multiple scenarios
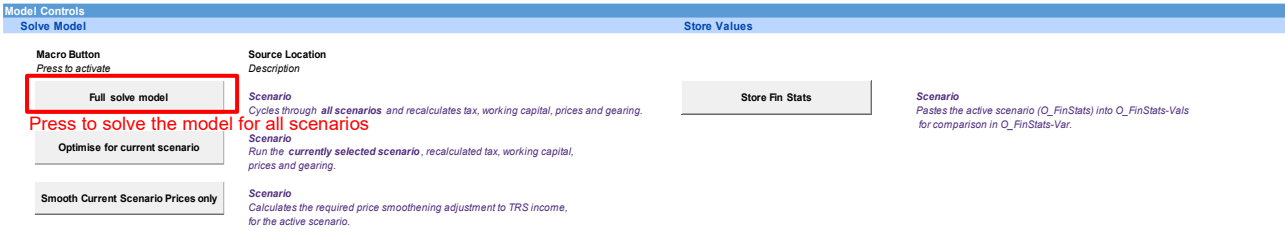
Source: PCM

Additional Functionality

This section describes additional functionality to allow the user to maximise use of the Model.

Storing FinStats

3.39   The user may freeze the live results in **O_FinStats** to compare future changes in the financial statements (and additional output metrics on this worksheet) to the stored values.

Figure 16A: Storing the Live Financial Statements
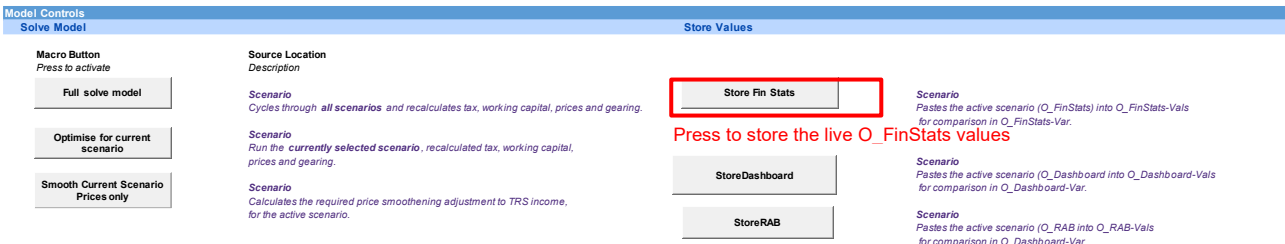
Source: PCM

3.40   Pressing the "Store Fin Stats" button under Model Controls (located **Scenario!J14**) will replace the current values in **O_FinStats – Vals** with the live values in **O_FinStats**.

- The time, date, model version, and scenario manager from the model version in which the Financial Statements were stored will be preserved to provide an audit trail for the user.

3.41   A message box prompt ("O_FinStats stored!") will confirm to the user once this has been performed.

3.42   It should be noted that once **O_FinStats – Vals** has overwritten the previous values, this cannot be undone without exiting the model and electing not to save any changes (prior to storing values).

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Storing Dashboard

3.43   The user may freeze the live results in **O_Dashboard** to compare future changes in the financial statements (and additional output metrics on this worksheet) to the stored values.

Figure 17B: Storing the Live Dashboard

Source: PCM

3.44   Pressing the "Store Fin Stats" button under Model Controls (located **Scenario!J19**) will replace the current values in **O_Dashboard – Vals** with the live values in **O_Dashboard**.

- The time, date, model version, and scenario manager from the model version in which the Dashboard is stored will be preserved to provide an audit trail for the user.

3.45   A message box prompt ("O_Dashboard stored!") will confirm to the user once this has been performed.

3.46   It should be noted that once **O_Dashboard – Vals** has overwritten the previous values, this cannot be undone without exiting the model and electing not to save any changes (prior to storing values).

Storing RAB

3.47   The user may freeze the live results in **O_RAB** to compare future changes in the financial statements (and additional output metrics on this worksheet) to the stored values.

Figure 18C: Storing the Live RAB

Source: PCM

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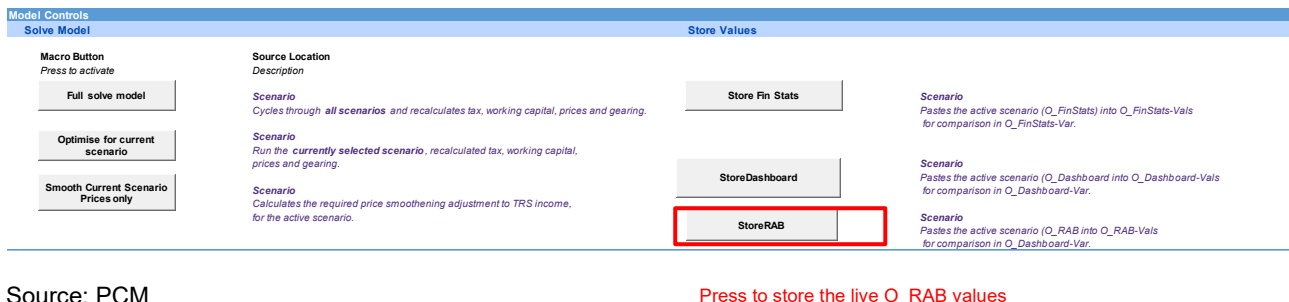
3.48   Pressing the "Store RAB" button under Model Controls (located **Scenario!J23**) will replace the current values in **O_RAB – Vals** with the live values in **O_RAB**.

- The time, date, model version, and scenario manager from the model version in which the Financial Statements were stored will be preserved to provide an audit trail for the user.
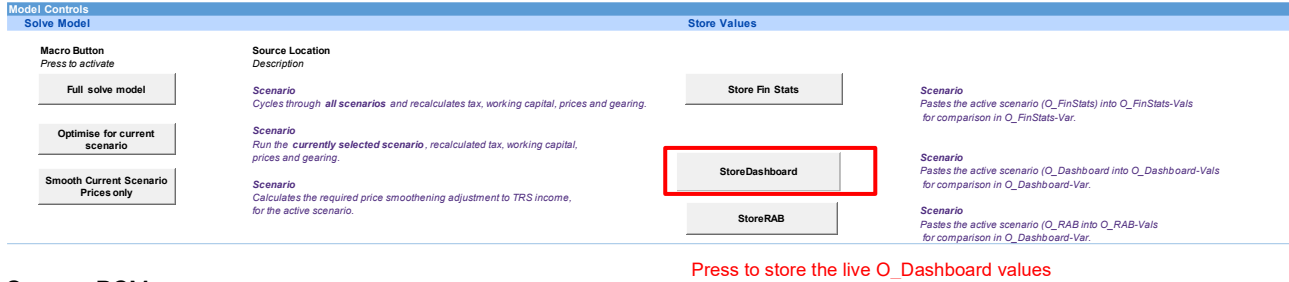
3.49   A message box prompt ("O_RAB stored!") will confirm to the user once this has been performed.

3.50   It should be noted that once **O_RAB – Vals** has overwritten the previous values, this cannot be undone without exiting the model and electing not to save any changes (prior to storing values).

Tax Mode

3.51   The user may elect <u>not</u> to include regulatory tax in the calculation of determined costs ("No REG Tax in DC") and may select this option in **Col:M** of the **Scenario** worksheet (named range, **rTaxModeAll**). By default, the Model includes regulatory tax ("REG Tax Calculated") when calculating determined costs.

3.52   When the tax mode is set not to include regulatory tax in the determined costs calculation ("No REG Tax in DC"), the grossed up tax charge calculated in both the **C_Determined Costs_UKATS** and **C_Determined Costs_Oceanic** worksheets will be set to zero, rather than the live value calculated on the **C_Reg_Tax_UKATS** and **C_Reg_Tax_Oceanic** worksheets.

Price Smoothing

3.53   The model includes the option to 'smooth' prices for the active scenario only, without re-solving the other areas of the model's calculation (IE; gearing, tax, and working capital).

3.54   This can be performed by pressing the button "Smooth Current Scenario Price only (located **Scenario!C21**).

New Debt Drawdown

3.55   In **'I_Series NERL'!AA440:BJ440** the user is able to elect whether to calculate the drawdown of new debt based on either:

- A target gearing profile ("Target Profiled Gearing");

- A target dividend amount ("Target Profiled Dividends"); or

- Not to solve for the period ("Do not solve").

3.56   Further detail of the approach to New Debt Drawdown is covered here.

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Chapter 4
Key Calculations

Introduction

4.1   The model is built around the concept that indexed Operating Costs are used to determine a price per flight (or price per TSU in the case of UKATS and London Approach). This is charged by UKATS, Oceanic and London Approach to generate revenue. The diagram below provides a highly simplified overview of this mechanism.

Figure 19: Simplified Model Mechanism
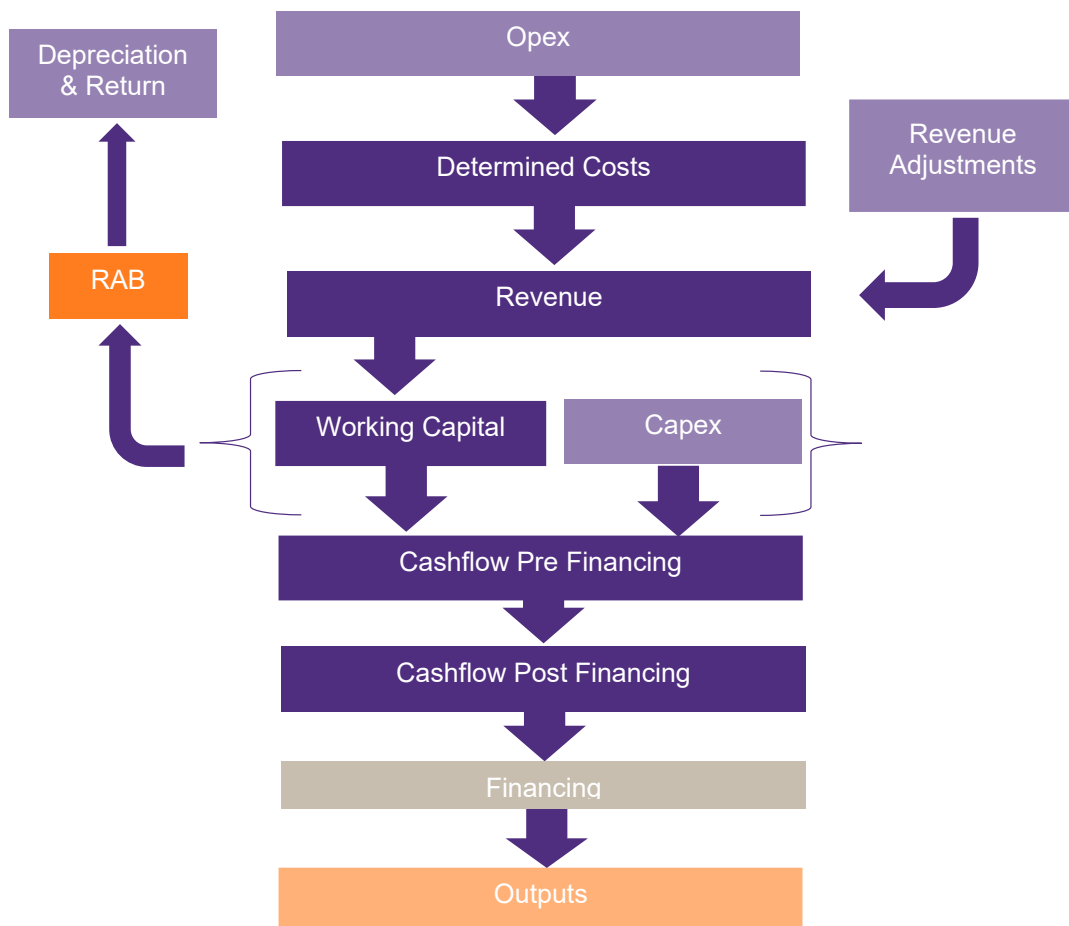
Source: CAA

4.2   This section provides an overview of the following concepts involved in different areas of the model:

- Regulatory Asset Base (RAB);

- Risk Share Mechanisms (TRS);

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- Working Capital;

- Gearing;

- Funding;

- Taxation;

- Capex;

- Indexation

- Revenue

- Price Smoothing; and

- Other Calculations (Revolving Capital Facility, Finance Lease).

Regulatory Asset Base

The Regulatory Asset Base (RAB) is the prescribed asset base upon which investors receive an allowed Regulatory Return.

4.3   RAB calculations have been built to reflect the NR23 RAB rulebook, and are performed separately for UKATS and Oceanic within **C_RAB_UKATS** and **C_RAB_Oceanic** worksheets. Outputs from each calculation worksheet are summarised at the UKATS, Oceanic, and Combined (UKATS and Oceanic) level within **O_RAB**.

- It is recommended that users refer to the RAB rulebook for further guidance surrounding the policies modelled. References to the RAB rulebook are included in the Model.

4.4   RAB inputs are provided on a common price basis (specified in **I_Global!F28**) before applying the indexation specified by the RAB rules.

4.5   The Model further includes the option to model two separate RABs, and divides the combined RAB calculations into "RAB 1" and "RAB 2". In the Model these are used as follows:

- **RAB 1** contains all the logic as described in the RAB rulebook; and

- **RAB 2** a supplementary additional RAB (not used for the purpose of the NR23 price control calculation).

4.6   The inclusion of RAB 2 provides users the options to:

- Map capital expenditure to a separate RAB (RAB 2);

- Apply a manual depreciation profile; and

- A different cost of capital.

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4.7   For UKATS (only), the user may also map a proportion of the Working Capital (related to Traffic Risk Share) to RAB2 rather than RAB1, for non-RP3 periods. This input assumption can be populated in **'I_Series UKATS'!E600**.

- **Note:** the RP3 TRS has been separated from the model's working capital calculations (Trade Debtors, Price Control Creditor), for transparency of the reducing balance as these amounts are returned over subsequent price control periods.

- As a modelling simplification, the option to allocate a proportion of the RP3 TRS to RAB 2 has not been provided for.

4.8   It should be noted that the sum of RAB 1 and RAB 2 is used for financing purposes, and that the regulatory return is calculated based on the return generated by both RAB balances.

4.9   A summary of the RAB balance for RAB 1 is provided at the top of each worksheet, including details of:

- RAB 1 Indexation of prior year closing balance;

- RAB 1 Adjustments[1];

- Estimated spectrum cost variance;

- Prior Period Spectrum Cost variance adjustment;

- Temporary Unit Rate Adjustment;

- Net capex for year;

- Real working capital movements;

- RP3 TRS real working capital movements[2];

- Allowed Depreciation for year;

- Backlog adjustment to Depreciation for year;

- Pension Contribution Variance for Calendar Year;

- RPI-CPI wedge variance adjustment[3];

- Capitalised financing costs (CFC); and

- Prior Reporting Period Tax clawback.

---

1 Used for historic adjustments to the RAB balance, only.

2 This line item represents a policy decision by the CAA to separate the RP3 Traffic Risk Share from the model's working capital calculations for transparency around its contribution to the RAB balance over subsequent price control periods (during the RP3 TRS release).

3 Modelled for the RP3 period only.

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4.10   Numbered sub-headings have been included in the Model to ease references to the RAB Rules and calculations included in the Model.

Risk share mechanisms

The model contains two primary risk sharing mechanisms around variation in the number of flights when determining prices (traffic risk share), and (cost risk share).

Traffic Risk Share (TRS)

4.11   The TRS is a mechanism to allocate the risk that the projected number of flights varies from the number of flights assumed when determining prices for the control period (i.e. there is a variance in the forecasted number of flights).

4.12   Any additional revenue due to differences between actual service units/flights and the service unit/flight forecast included in the performance plan for that year shall be passed on to airspace users, and any revenue loss shall be recovered from airspace users through a subsequent adjustment.

4.13   The model's TRS calculations are produced for UKATS, Oceanic, and London Approach, on the: **C_RevCost_UKATS**, **C_RevCost_Oceanic**, and **C_RevCost_LA** worksheets.

4.14   The Model is set up such that four bands (with a percentage input) are included, and the Model user can determine:

   a) Threshold levels for each band (as a % change from the forecast assumptions); and

   b) How much of the revenue risk is shared with users within each band.

4.15   The release of the TRS revenue calculated in each of the four bands can be delayed by a "lag" factor of n number of years.

   ▪ It should be noted that Band 3 and Band 4 have the ability to change the lag factor for positive and negative movements **('C_RevCost_UKATS'!5765:645**, **'C_RevCost_UKATS'!648:728**).

   ▪ Bands 1 and 2 <u>do not</u> distinguish between positive and negative TRS releases, and the lag factor will be identical, regardless of the direction of the release.

4.16   For UKATS and London Approach, the inputs controlling the size of the variance-bands are located in **'I_Series UKATS'!E610:BJ6326**. The inputs for the percentage of risk shared with users are located in: **'I_Series UKATS'!E641:BJ645**. For Oceanic these are located in **'I_Series Oceanic'!362:378**.

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UKATS Specific Differences

4.17   For UKATS, there is a separate RP3 mechanism, whereby the traffic risk share adjustment for RP3 is deferred and released based on an input profile defined within **'I_Series UKATS'! Rows 694:713**.

4.18   The return NERL is expected to have earned on these TRS amounts over RP3 are added to the Traffic Risk Share Adjustment for the current year here: **C_RevCost_UKATS Row 414**, the RP3 return exported to TRS is calculated on the **C_NERL_Adjustment** worksheet.

4.19   The user has the option to apply an additive (increased or (decrease)) to the TRS adjustment for the current year in: **'I_Series UKATS'! Row 608.**

4.20   The TRS adjustment for the current year also includes the impact of the calculated adjustment for the 2023 temporary unit rate (within **C_PriceSmoothing**), and similarly any price profiling (smoothing) adjustments calculated for the remainder of the period prices are smoothed.

RP3 TRS Adjustment

4.21   The Model has been configured such that an adjustment has been posted to reflect the variance between CMA estimated costs and the CAA's estimated costs for the period of 2020 to 2022. This is presented in I**C_TRS_Cost Rec bridge.**

4.22   It is important for the model user to know how to disable this adjustment. The adjustment can be disabled by applying:

1. Clear the inputs in **'I_Series UKATS'!608:608** (labelled UKATS TRS DC Manual Override);

2. Clear the inputs in **'I_Series UKATS'!764:764** (labelled CMA Adjustments); and

3. Change the input in **'I_InputSets UKATS'!154:154** to be "Use Determined Costs" (Not: "For RP3 use Efficient Costs").

4.23   This will allow users to run the model without the impact of the RP3 TRS Adjustment.

Cost Share (CSM)

4.24   The Model calculates the forecast Cost Share Mechanism (CSM) for future control periods (up to and including NR28) based upon calculations for the Pensions Passthrough Adjustment Depreciation and Regulatory Return.

4.25   These are calculated through separate Pension Passthrough RAB calculations for each Price Control period shown in **'C_RAB_UKATS'!467:850**.

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4.26   Within the main RAB, Pension Passthrough Costs are already included so there is an adjustment to avoid any double-counting of regulated depreciation and return (in addition to the CSM adjustment) in **'C_Determined Costs_UKATS'!250:250** and **'C_Determined Costs_UKATS'!195:195**.

Working Capital

The standard calculations for working capital are based on calculating a target debtor & creditor days.

4.27   The model's working capital calculations are undertaken in **C_RevCost_UKATS, Rows 1009:1284** for UKATS and **C_RevCost_Oceanic Rows 629:812** for Oceanic.

4.28   Movements in working capital are exported to RAB calculation worksheets (**C_RAB UKATS**, **C_RAB Oceanic**) to calculate real working capital movements, and are made up of the following components:

- Trade Debtors;

- Prepayments;

- Price Control Creditor;

- Opex Creditor;

- MOD Gain Share Creditor;

- Accruals;

- Provisions; and

- Price Control Liability (Working Capital impact of DfT/CAA/METS Charge collection).

4.29   **Trade Debtors** are calculated based on a target balance, which takes calculated revenue and multiplying by the number of months expected to collect revenue divided by 12[4]. RP3 TRS revenues (released from the deferred RP3 TRS balance) are separated to calculate both a UKATS and UKATS RP3 Trade Debtors, in order to separate the working capital impact of the RP3 TRS in the UKATS RAB.

4.30   **Prepayments** are calculated from total operating costs, which takes total operating costs and multiplying by the number of months expected for prepayments divided by 12.

4.31   **Price Control Creditor** includes specific modelling in UKATS and Oceanic. The Price Control Creditor is a working capital balance which recognises the

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4 Each modelled period is for 12-months as the model's timeline is prepared on an annual basis.

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difference between the revenue recognised in year (based upon agreed charges and actual flights/TSU) and the revenue received (based upon agreed charges and forecast flights/TSU). The final output from the calculation can be either a Debtor or a Creditor, with this balance then being included in the 'Real working capital movements' section in the RAB calculation.

- For UKATS, the Price Control Creditor (as with Trade Debtors) separates revenues associated with the RP3 TRS to isolate the working capital impact of the RP3 TRS in the RAB calculation.

- The Price Control Creditor calculation for non-RP3 TRS revenues includes the option to allocate a proportion of the non-RP3 TRS to the RAB2 calculation. This functionality is not replicated for the RP3 TRS Price Control Creditor.

4.32   **Opex Creditor** are calculated from total operating costs, which takes total operating costs and multiplying by the number of months for Creditor day adjustments divided by 12.

4.33   **MOD Gain Share Creditor** are based on previous actuals and forecast MOD Gain Share Creditor balances input into the Model.

4.34   **Accruals** are calculated from total operating costs, which takes total operating costs and multiplying by the number of months for Accruals adjustments divided by 12.

- It's noted that whilst the Model includes previous (actual) Accruals, that 100% of total operating costs are allocated to the Opex Creditor account for forecast periods. Therefore, the Accruals adjustments are set to zero months.

4.35   **Provisions** are based on actual inputs for Provisions to establish movement in the UKATS/Oceanic provisions.

4.36   **Price Control Liability** for DfT, CAA and MET charges are modelled separately outside the main working capital calculation block **C_RevCost_UKATS!B890**. The Price Control Asset/Creditor accounts for the DfT, CAA, and MET charges are based on the forecast costs to be recovered through these charges alongside variations in TSUs (Actual TSUs / Forecast TSUs). A lag factor specified in **C_RevCost_UKATS!F9230**, is used to model when these charges are recovered.

Gearing

4.37   The model contains four metrics for calculating the live gearing value, depending on the definition of "Net Debt" chosen by the user. The different metrics included in the model, are:

- Net Debt (PCM Original) / RAB;

- Net Debt (PCM Original, with PV of Leases) / RAB;

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- Net Debt (all liabilities) / RAB; and

- Net Debt (NERL Method) / RAB.

4.38   These gearing metrics can be found in **C_Financing**, under the "Gearing" subheading": **C_Financing!A497.**

4.39   The live gearing metric used by the model can be selected in cell **I_Ratios!F70**. This metric is referenced by the **New Debt** goal-seek functions described further in <u>New Debt</u>, and is reported elsewhere as part of the model's ratio calculations.

Funding

Funding calculations include calculations for existing debt, leasing, and new debt.

Existing

Existing Debt

4.40   The model does not provide the facility to make any calculations relating to existing debt the notional company may have.

4.41   Instead, the associated interest and repayment profiles are based upon user inputs. The Model has inputs for opening balances (**I_Actuals!E61**), interest & fees (**'I_Series NERL'!E91**), and repayment profiles (**'I_Series NERL'!E94**).

Existing Swaps

4.42   The model allows users to enter an outstanding notional balance (**'I_Actuals'!237:237**), an amortisation profile (**'I_Series NERL'!132:132**) , an interest rate for the payer leg (**'I_Series NERL'!134:136**) and an interest rate for the receiver leg (**'I_Series NERL'!140:142**).

4.43   This allows the Model to forecast the repayment of the existing swapped liability.

New Debt

4.44   The model includes two methods for determining "New Debt" (debt over and above the existing debt input into the Model) which will be drawn down. These methods are:

- Target Profiled Gearing, or;

- Profiled Dividends.

4.45   Likewise, the user may elect "not to solve" for gearing during an individual period.

4.46   A combination of methods can be used in a scenario. The drawdown method used for a specific model period is controlled in **'I_Series NERL'!440:440**.

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Target Gearing Method

4.47   The Model uses both a target gearing level and cash balance level to determine if additional "New Debt" (debt over and above the existing debt input into the Model) is required, and if cash payments to and from shareholders will occur.

4.48   The behaviour of the Model is outlined in **Table 3** below:

Table 3: Gearing Targets

Gearing (Net Debt:RAB)	Cash Balance prior to repayment	Model Behaviour
Below target	Cash Balance above minimum target	Debt will be raised to meet gearing target, and surplus cash [over and above forecast additional debt serving requirements] will be distributed to shareholders.
Above target	Cash Balance above minimum target	Cash will be retained not distributed / new cash raised from shareholders to reduce Net Debt to gearing target.
Below target	Cash Balance below minimum target	Debt will be raised to meet gearing target. If there remains a shortfall of cash this will be raised from shareholders.
Above target	Cash Balance below minimum target	Cash will be raised from shareholders to meet targets.

Source: CAA

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4.49   The minimum cash balance is set in **'I_Series NERL'!111:111**. Target debt profiles are entered in **'I_Series NERL'!78:80** and selected in **'I_InputSets NERL'!E28:G28**.

Profiled Dividends Method

4.50   In this mode the model will attempt to raise debt such that a target profile of dividends is paid out. Four conditions are checked to determine if a drawdown should occur:

1. *Is the Cashflow for Debt Servicing greater than zero?*
   This checks that the model has enough cash to service its debt.

2. *Is gearing less than 100%?*
   This ensures that gearing will not rise about 100%.

3. *Is the gearing greater than 0%?*
   This ensures that gearing will not fall below 0%.

4. *A Dividend variance check.*
   This checks that the dividends output are equal to the input dividend profile.

4.51   The profile of dividends the model will solve to is set in **'I_Series NERL'!440:440**.

4.52   Both Gearing methods (Target Profiled Gearing, Profiled Dividends) include check conditions to stop the model's goal-seek VBA routine when one of the above conditions are not satisfied (0 = stop goal seek). These can be located on the C_Financing, as the named ranges: **rStopGearingGoalSeek** (Checks to Stop Goal-Seeking Dividend), and **rStopGearingGoalSeek_Gearing** (Checks to Stop Goal Seeking Target Gearing).

4.53   Summary diagnostics from the combination of gearing options selected, and the macro driven behaviour are provided in **C_Financing!148:152**.

Other Financing Controls

4.54   The model contains several inputs designed to let the user sculpt the profile of the cashflows in the model.

4.55   These other financing controls include:

- **Controlling if automatic dividends payments occur**
  Allow Payment of Dividends in Period?

  ○ When set to (1 = Yes), any spare cash is paid out of the model (**'I_Series NERL'!E206**).

  ○ Note: This will still allow profiled (user input) dividends to be paid out.

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- **Raising cash from shareholders**
  Allowing raising of cash from Shareholders?

  - When set to (1 = Yes), a cash shortfall (after gearing target) will result in attempting to raise cash from shareholders (**'I_Series NERL'!E203**).

- **An Option to Force the Model to pay out a profiled input of dividends**
  Equity Transfer (to)/from Shareholders – Override.

  - This is independent of the profile input used to control the "Profiled Dividend" gearing control. It lets the user force the model to reduce cash in the form of paying out dividends (**'I_Series NERL'!E209**).

Type of Debt Raised

4.56   The type of debt used to model "New Debt" is either:

- a non-indexed debt instrument; or

- a synthetic index linked debt instrument.

4.57   The proportion of debt that is raised via synthetic index-linked debt is determined in **'I_Series NERL'!E152:BJ152**.

4.58   Cash required is calculated after taking account of operating revenues and costs, planned capital investment funding and existing debt service obligations, while maintaining a minimum cash balance (an input value) and the gearing target. Where additional funding/debt is required, this is drawn annually for the assumed term and (profiled) interest rate.

Synthetic Debt

4.59   This debt is calculated in a similar manner to new debt, with interest applied annually and a bullet repayment set at the end of the loan term.

4.60   In addition, there is an accretion mechanism which indexes the principal borrowed which is then settled based upon the repayment term for accretion (**'I_InputSets NERL'!70:70**).

4.61   Interest is also charged on the accumulated balance applying a different interest rate assumption to the debt borrowed (**'I_Series NERL'!E121**).

4.62   Any new debt that raised as index-linked synthetic debt is modelled on the **C_Fin_Synth** worksheet. The price index used to calculate the Synthetic Debt is set in **'I_InputSets NERL'!E69:G69**.

Taxation

Taxation in the Model is based on a regulatory tax calculation. This approach (versus an accounting tax calculation), allows the user to input a vanilla WACC into the model, as

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opposed to a pre-tax WACC. The option to include or exclude regulatory tax from the Determined Costs building block is available under "Tax Mode" in the **Scenario** worksheet.

4.63   Conceptually profit is calculated based on revenues received minus the costs incurred. Based on the building block structure of the regulation, profit in this instance, is calculated based on the differences observed between Determined Costs and Opex, adjusting for other income received from other P&L items.

4.64   This approach aims to mitigate model circularities introduced through a traditional approach (revenues minus costs) due to circularities where regulatory return feeds into determined costs, and likewise tax impacts working capital which feeds into the RAB calculation.

4.65   Calculations supporting the regulatory tax method are performed across two worksheets **C_Reg_Tax_UKATS** and **C_Reg_Tax_Oceanic** for the UKATS and Oceanic revenue streams.

4.66   **There are four stages to arrive at the corporation tax charge:**

1.   Calculate the Tax Base;

2.   Apply Tax Adjustments to this Tax Base (arriving at Profits Attributable to Corporation Tax);

3.   Utilise any prior tax losses; and

4.   Apply the corporation tax rate to Profits Attributable to Corporation Tax, removing any estimated tax on Patent Box, and grossed-up RDEC amounts.

Tax Base

4.67   The tax base is calculated as allowances between recalculated determined costs and operating costs, noting the source worksheet where the calculation draws on linked cells elsewhere within the Model.

▪   For the users reference, individual other income line items are removed initially, but are subsequently added back at the "Profits Attributable to Corporation Tax (pre Tax Adjustments)" stage.

▪   To mitigate a potential Model circularity, a modelling simplification excludes the working capital impact for changes in determined cost from the regulatory tax calculation. The impact of this is actively monitored through two model alerts (**Checks!F71:F72**), based on a user defined alert tolerance value.

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Figure 20: Tax Base Calculation

Tax Base			
Differences between Determined Costs and Total OPEX (exc. WC impact of change in Determined Costs)			
Excluding - Revenue adjustments (ex. TRS)	£'000	Nominal	C_Reg_Tax_UKATS
Including - TRS Adjustments	£'000	Nominal	C_Reg_Tax_UKATS
Regulatory Depreciation	£'000	Nominal	C_Determined Costs_UKATS
Regulatory Return - UKATS	£'000	Nominal	C_Determined Costs_UKATS
Adjustments	£'000	Nominal	C_Determined Costs_UKATS
Eurocontrol Revenue (Other) - Price Determination NEG	£'000	Nominal	C_Determined Costs_UKATS
London Approach Revenue NEG	£'000	Nominal	C_RevCost_LA
MoD Income - Price Determination NEG	£'000	Nominal	C_Determined Costs_UKATS
North Sea Helicopters - Price Determination NEG	£'000	Nominal	C_Determined Costs_UKATS
Intercompany income - Price Determination NEG	£'000	Nominal	C_Determined Costs_UKATS
Other UKATS Revenue Spare - Price Determination NEG	£'000	Nominal	C_Determined Costs_UKATS
Adjustment for Working Capital Impact of change in Determined Cost	£'000	Nominal	*Tax Simplification - Removed*
Allowances - Recalculated Determined Costs vs Total OPEX	£'000	Nominal	
Excluding - Variance in DC/P&L Determined Costs	£'000	Nominal	-
Excluding - (Increase)/Decrease in UKATS Provision	£'000	Nominal	-
Excluding - Movement in Pension Asset - I&E Charge	£'000	Nominal	-
Total Other Income	£'000	Nominal	*Include Other Income in Tax Base*
Profits Attributable to Corporation Tax (pre Tax Adjustments)	£'000	Nominal	

Source: PCM

4.68   The tax base calculation includes five line items influenced by the regulatory tax controls in **I_Global**, covering:

- The inclusion/exclusion of revenue adjustments (excluding TRS);

- The inclusion/exclusion of elements of the TRS;

- The inclusion/exclusion of the variance between pension expenses in the determined cost building block and reporting pension expenses in the P&L;

- The inclusion/exclusion of movements in pension assets (due to revaluation); and

- The inclusion/exclusion of provisions.

4.69   Each of these five line items feature a dynamic line item label. When the relevant tax controls in **I_Global!F352:F368** are selected as:

- "Yes", the line item label will be prefixed with "Including – "; else

- If the selection is "No", the line item will display a value of zero and the label will be prefixed with "Excluding –".

4.70   The result of the Tax Base calculation block arrives at Profits Attributable to Corporation Tax (pre tax adjustments).

Tax Adjustments

4.71   The Model applies three adjustments to arrive at Profits Attributable to Corporation Tax, considering:

- Interest expense (notional company, or live model interest & fees);

- Patent Box deduction; and

- Capital allowances.

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4.72   **Interest expense** is based on the live regulatory tax control selected in **I_Global!F361**, "Interest Expense = allowed cost of debt times the net debt". If the user selects:

- "Yes" - then the interest expense to deduct from profits attributable to corporation tax is calculated based on a CAA assumed interest rate for a Notional company and Net Debt (pre-interest, pre-tax)[5] calculated on **C_Financing!E374**; else

- If the user selects "No" then this is based on the live interest expense calculated in the model, including fees.

4.73   The interest expense line item is labelled dynamically to reflect the users choice, displaying "Interest Expense (Notional Company)" if "Yes" to the regulatory tax control, and "Total Interest" if "No".

4.74   The interest expense is calculated for UKATS and Oceanic proportionally based on each's share of the combined RAB balance at the end of the period.

4.75   **Patent Box deduction** is based on the Patent Box and RDEC inputs populated in **'I_Series NERL'!E447**. Like with interest expense, this is calculated for UKATS and Oceanic proportionally, based on the share of the combined RAB balance at the end of the period.

4.76   **Capital allowances** are removed from profits attributable to corporation tax, and have been modelled on the basis of the latest UK budget and government publications at the time of modelling.

4.77   Capital allowances are based on new additions to Capex, and the capital allowance allocations assumed for each of the ten capex categories in: **'I_Series NERL'!B222:B437**.

4.78   Capital allowances are included in the Model for the following asset pools: Main Pool, Special Rate pool, Super deduction, R&D, and Long life assets. Alongside an allowance for Structure and Building Rate Tax.

- Integrity checks are included here to check that the sum of capital allowance allocations between asset pools total to 100%, and that project cash flows total 100% between their allocation to RAB1, RAB2, or those project cash flows indicated as non-qualifying.

4.79   **Main Pool tax allowances** are calculated using a balance calculation. Each period the existing main pool balance is adjusted to include any new capital

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5 The purpose of this calculation is to estimate a notional interest expense. It should be noted that interest received/paid on cash balances and RCF interest costs are also included.

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additions to the main pool, less the written down balance at the written down allowance (WDA) rate.

- Note: the model includes adjustments to exclude assets which claim R&D Capital Allowances and Long Life Asset Allowances, populated in "Other Tax" inputs **'I_Series UKATS'!B779**.

4.80   **Special Rate Pool tax allowances** are calculated in a similar manner to Main Pool tax allowances, except for applying a separate Special Pool WDA rate to the special rate pool balance.

4.81   **Tax depreciation for Super Deductions** are calculated based on new capital expenditure qualifying for super deduction. Live tax depreciation is calculated based on these amounts, and applying the super deduction assumption populated under Capital Allowance inputs within **'I_Series NERL'!158:163**.

- Note: the super deduction pool may be used to model full-expensing when the Tax Depreciation – Super Deduction rate is set to 100%.

4.82   **Structure and Building rate tax allowances** are calculated based on a balance calculation, adding new capital expenditure additions qualifying for the structure and building rate tax allowances, and removing prior allowances based on a look back period for removal. The look back period for removal is calculated to the nearest year, based on the structures and building rate tax allowance %, defined in **'I_Series NERL'!158:163**.

4.83   **R&D capital tax allowances** are direct inputs into the Model, and are populated under "Other Tax" inputs in **'I_Series UKATS'!E781**.

4.84   **Long life asset tax allowances** are direct inputs into the Model, and are populated under "Other Tax" inputs in **'I_Series UKATS'!E782**.

4.85   **Expensed tax allowances** are calculated based on new capital expenditure allocated to the expensed capital allowance pool, for each forecast period. This capital allowance category is not in use for NR23.

4.86   Total capital allowances included in the model's tax calculation can be viewed in **C_Reg_Tax_UKATS!466:475** (UKATS), and **C_Reg_Tax_Oceanic! 109:117** (Oceanic).

- As capital allowances are calculated based on total capex additions (UKATS and Oceanic), capital allowances are allocated proportionally between UKATS and Oceanic, based on the share of the combined RAB balance at the end of the period.

Utilise Tax Losses

4.87   Prior to the Corporation Tax Charge, Profits Attributable to Corporation Tax are adjusted to model the use of Tax Losses from prior periods.

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4.88   For each of the revenue streams, the offset of any brought forward tax losses against future available "Profits Attributable to Corporation Tax" is calculated by sharing the annual allowance for tax losses offset according to the RAB proportions of UKATS and Oceanic. An adjustment for Research and Development Expenditure Credit (RDEC) is then subsequently made (described in the following section).

Corporation Tax Charge

4.89   The final stage of the regulatory tax calculation is based on Corporation Tax Charges (after losses), applying allowances for UKATS/Oceanic Share of Tax on Patent Box, and Grossed up RDEC.

4.90   The Model calculates two corporation tax charges:

1. **UKATS - Corporation Tax Charge [REG] [NEG][6]** – feeds into the model's financial statements; whereas

2. **UKATS - Corporation Tax Grossed Up Adjustment for Cost of Capital [REG]** – applies an adjustment to remove the corporation tax rate from the amount calculated. This is due to the inherent circularity of the corporation tax charge feeding into the model's Determined Costs calculations and thereby Determined Revenues – double-counting the application of corporation tax.

4.91   **Tax on Patent Box** is calculated based on the Patent Box deduction described under "Tax Base", and applying the Patent Box tax allowance rate input within **'I_Series NERL'!E178**. This is removed from the final Corporation Tax Charge to avoid double-counting these amounts.

4.92   **R&D Expenditure Credit (RDEC) tax allowances** are calculated based on the value of the qualifying spend **'I_Series NERL'!E448**, applying the RDEC tax allowance rate. The "grossed up" value of RDEC adjusts this value to remove corporation tax at the modelled rate, before applying the UKATS/Oceanic share based on the proportion of the combined RAB.

  ▪ These allowances are based on the most recent UK budget published at the time of modelling.

Capex

Capex is based on allowed cash flows allocated to individual projects.

4.93   The Model provides for up to 20 individual capex projects (profiles), and 3 inputs sets for these 20 projects.

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6 [NEG] refers to the tax charge presenting costs as a negative value, to clarify the sign convention.

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4.94   Capex is assumed to be accrued and settled in the year, therefore capital creditors are not included in the Model.

4.95   Capex is calculated via a two-step process:

- Cash flows are entered against a project (there are 20 projects each for UKATS and Oceanic); and

- For each project there is a mapping to one of ten capital expenditure "categories" which are common across the model.

4.96   Each category has an associated tax treatment and useful economic life for accounting depreciation purposes.

4.97   Individual projects can be switched on and off within **I_InputSets Oceanic** and **I_InputSets UKATS** input areas.

4.98   Capex inputs are not profiled within the model directly, and the category allocation is used to group common capex elements for the appropriate tax and accounting depreciation treatment.

Indexation

4.99   All indices are calculated with a common base year. In the default model inputs are set to calendar year 2020 in **'I_Global'!F28**.

4.100   There are two exceptions to this: HICP & FHICP which have different price bases for each reporting period. These are specified in **'I_Global'!F284:F287**. These values are then used for the inflation [INF] adjustments in license payments.

Revenue

4.101   Allowed Revenues are based upon Determined Costs and adjustments.

4.102   In respect of each Price Control Period the Model will first calculate the Determined Cost for each year (in real terms). This will then be used to calculate the revenue charged for each revenue stream and the cash generated.

4.103   The key outputs for the revenue calculations are the revenue accrued and the cash generated, with a variance going to create a price control creditor (or debtor). The location of these outputs can be found below:

Price Smoothing

4.104   The Model also has the option (if selected by user) to smooth the regulated charges during each year of a Control Period. This is set at a scenario level in **'I_Scenarios'! N42:N51**.

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4.105   The price smoothing logic works by taking revenue and discounting it. A "factor" is then calculated via goal seek, performed in a VBA routine as part of the wider Price Determination calculation. The factor is solved such that the NPV of the smoothed profiled charges equals the NPV of the original discounted revenue.

4.106   The user has two options for profiling prices:

1. **Unprofiled** - Unprofiled prices are calculated, no smoothing is applied.

2. **Flat Prices** - Smoothing is applied such that flat (horizontal) line is calculated over the price control period.

Other Calculations

Revolving Capital Facility

4.107   The Model includes a Revolving Capital Facility (RCF) as part of its cashflow calculations.

4.108   RCF drawings are treated as debt for the purposes of gearing calculations. The average balance drawn input can be located at **'I_Series NERL'!E100'**.

4.109   Interest is charged on the average drawn balance while a commitment fee is charged on the average unused balance.

Finance Lease

4.110   Lease workings include depreciation, interest and repayment which are input-based. Lease entries will be calculated outside the Model and so the profile will be entered as inputs.

4.111   Please note that that this approach would only allow for simplified sensitivities to be run (e.g., all leased asset costs increase +/- x% which would be applied to lease cash payments, finance charges, depreciation, and repayments of lease liability).

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Model Version: CAA NERL PCM Provisional Decisions_10h - v1.00   Chapter 4: Abbreviations

APPENDIX A

Abbreviations

Abbreviations	
AAHK	Airport Authority Hong Kong
ACL	Airports Coordination Limited
AICC	assets in the course of construction
AIO	assets in operation
capex	capital expenditure
CC	Competition Commission
CE	Constructive Engagement
CMA	Competition and Markets Authority
DAA	Dublin Airport Authority
DfT	Department of Transport
EU	European Union
FSC	full service carrier
G2	a second runway at Gatwick to the south of the existing airport
GAL	Gatwick Airport Limited
H3	a runway at Heathrow, north west of the existing airport
HAL	Heathrow Airport Limited
HH	westward extension of the northern runway at Heathrow Airport
HKIA	Hong Kong International Airport
IP	Infrastructure Provider
LBC	Licence Backed Commitments
LCC	low cost carrier

LNG	liquefied natural gas
MCC	material change in circumstances
MPD	market power determination
OFTOs	Offshore Transmission Owners
opex	operational expenditure
Abbreviations (continued)	
PSDH	project for the sustainable development of Heathrow
Q1, Q2, etc.	The first, second etc. quinquennium review periods
RAB	regulatory asset base
rTPA	regulated Third party access
SMP	substantial market power
SPV	special purpose vehicle
STAL	Stansted Airport Limited
the Act	Civil Aviation Act 2012
the Commission	Airports Commission
WACC	weighted average cost of capital
WCML	West Coast Main Line

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APPENDIX B

Summary of Macros

This appendix details the procedures included in the Model, alongside the individual sub-routines in use.

Gearing

GearingStoreOne

Sub routine name	**GearingStoreOne**
Module name	Mod_GSGearing
Purpose	This macro is used to calculate and store debt drawdown profile for the live scenario in the model.
Function of macro	The macro allows for goal seeking of debt drawdown profile based on current model inputs, by switching to live calculations instead of stored values of debt drawdown profile. Once the drawdown profile is calculated, it is stored in **Macro** worksheet.
Activation mechanism	The macro is used in conjunction with other subroutines as described below.

GoalSeekGearing

Sub routine name	**GoalSeekGearing**
Module name	Mod_GSGearing
Purpose	This macro allows to calculate debt drawdown profile for all years.

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Sub routine name	**GoalSeekGearing**
Function of macro	The macro considers the debt drawdown requirement based on model inputs for target gearing/target dividends. It further uses other macros to calculate required debt drawdown to satisfy gearing/dividend requirement for each year.
Activation mechanism	The macro is used as part of the 'GearingStoreOne' subroutine.

GoalSeek

Sub routine name	**GoalSeek**
Module name	Mod_GSGearing
Purpose	This macro allows to calculate debt drawdown profile for a particular year.
Function of macro	The macro checks the requirement for drawdown of additional debt in a given year, based on model inputs (using 'checkStopCondition' - UDF). If additional drawdown is required, the macro further uses other macros and UDF ('alterDrawdown') to calculate required debt drawdown to satisfy gearing/dividend requirement for the year.
Activation mechanism	The macro is used as part of the 'GoalSeekGearing' subroutine.

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IncrementalChangeUp

Sub routine name	**IncrementalChangeUp**
Module name	Mod_GSGearing
Purpose	This macro allows for an increase in debt drawdown amount.
Function of macro	The macro uses the methodology of an incremental addition to the calculated debt drawdown value, to ensure target gearing/dividend payout is achieved.
Activation mechanism	The macro is used as part of the 'GoalSeek' subroutine.

IncrementalChangeDown

Sub routine name	**IncrementalChangeDown**
Module name	Mod_GSGearing
Purpose	This macro allows for a decrease in debt drawdown amount.
Function of macro	The macro uses the methodology of an incremental reduction in the calculated debt drawdown value, to ensure target gearing/dividend payout is achieved.
Activation mechanism	The macro is used as part of the 'GoalSeek' subroutine.

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Price Smoothing

ProfilePrices

Sub routine name	ProfilePrices
Module name	Mod_Prices
Purpose	This macro is used to calculate price smoothing adjustment to the TRS income to achieve smooth prices.
Function of macro	Based on the selected smoothening option for the active scenario, an adjustment to the TRS income is calculated (goal seek). The macro also stores the calculated smoothening adjustment for the scenario using additional macro.
Activation mechanism	'Smooth Current Scenario Prices only' button on the **Scenario** worksheet. The macro is also used as part of the 'Solve' subroutine.

StoreVals

Sub routine name	StoreVals
Module name	Mod_Prices
Purpose	This macro is used to store the calculated price smoothing adjustment, as discussed above.
Function of macro	The macro automatically stores the output for goal-seeked price smoothing calculations.
Activation mechanism	The macro is used as part of the 'ProfilePrices' subroutine.

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Store FinStats

StoreFinStats

Sub routine name	**StoreFinStats**
Module name	Mod_ StoreFinStats
Purpose	The macro allows the user to compare the live scenario outputs in **O_FinStats** worksheet with stored outputs in the **O_FinStats – Vals** worksheet.
Function of macro	The macro copies and stores the outputs of the active scenario in the **O_FinStats - Vals** worksheet, allowing the user to analyse output variance in **O_FinStats – Var** worksheet, by activating a different scenario in the model.
Activation mechanism	'Store FinStats' button on the **Scenario** worksheet.

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Taxation

ResetTaxMode

Sub routine name	**ResetTaxMode**
Module name	Mod_Tax
Purpose	The macro is used to set the 'Tax Mode' to "No REG Tax in DC" for all scenarios in the **Scenario** worksheet.
Function of macro	This macro is part of the 'Solve' subroutine which also calculates and stores the tax for the current (or all) scenario(s) in the model.
Activation mechanism	The macro is used as part of the 'Solve' subroutine.

RestoreTaxMode

Sub routine name	**RestoreTaxMode**
Module name	Mod_Tax
Purpose	The macro is used to restore the original 'Tax Mode' inputs for all scenarios in the **Scenario** worksheet.
Function of macro	This macro is part of the 'Solve' subroutine which also calculates and stores the tax for the current (or all) scenario(s) in the model.
Activation mechanism	The macro is used as part of the 'Solve' subroutine.

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TaxLoop

Sub routine name	**TaxLoop**
Module name	Mod_Tax
Purpose	The macro is used to automatically store calculated values for working capital and tax, using additional subroutines as described below.
Function of macro	This macro is part of the 'Solve' subroutine which also calculates and stores the tax for the current (or all) scenario(s) in the model.
Activation mechanism	The macro is used as part of the 'Solve' subroutine.

wcmStoreOne

Sub routine name	**wcmStoreOne**
Module name	Mod_Tax
Purpose	The macro is used to automatically store the calculated values for working capital movement for UKATS and Oceanic separately, for the active scenario.
Function of macro	This macro is part of the 'Solve' subroutine which also calculates and stores the tax/working capital for the current (or all) scenario(s) in the model.
Activation mechanism	The macro is used as part of the 'TaxLoop' subroutine.

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tcgross_Store

Sub routine name	tcgross_Store
Module name	Mod_Tax
Purpose	The macro is used to automatically store the calculated values for grossed up corporate tax for UKATS and Oceanic separately, for the active scenario.
Function of macro	This macro is part of the 'Solve' subroutine which also calculates and stores the tax/working capital for the current (or all) scenario(s) in the model.
Activation mechanism	The macro is used as part of the 'TaxLoop' subroutine.

ResetTax

Sub routine name	ResetTax
Module name	Mod_Tax
Purpose	The macro is used to automatically make the stored values of the active scenario as 'zero' for 'grossed up corporate tax' and 'working capital movement', for both UKATS and Oceanic (in 'Macro' sheet).
Function of macro	This macro is part of the 'Solve' subroutine which also calculates and stores the tax/working capital for the current (or all) scenario(s) in the model.
Activation mechanism	'Full model solve' and 'Optimise for Current Scenario' buttons on the **Scenario** worksheet.

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Price Determination

Store_DC_Initialise

Sub routine name	**Store_DC_Initialise**
Module name	Mod_StoreDC
Purpose	The macro is used to automatically check and update the model depending on the activation button used on the **Macro** worksheet.
Function of macro	This macro uses additional macros described below to either run the active scenario or all scenarios in the model. As part of this process, all stored outputs for the live scenario (or all scenarios) are recalculated and overwritten.
Activation mechanism	'Full model solve' and 'Optimise for Current Scenario' buttons on the **Scenario** worksheet.

Solve

Sub routine name	**Solve**
Module name	Mod_StoreDC
Purpose	The macro is used to calculate the entire model and update the stored values for the current scenario ('Macro' sheet).
Function of macro	This macro uses several macros described in this document based on the following approach ▪ Set macro calculated debt drawdown to zero ▪ Store existing tax modes for all scenarios ▪ Set the stored value for Grossed up tax and working capital movement to zero (in **Macro**) ▪ Set tax mode for the scenario to "No REG Tax in

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Sub routine name	Solve
	DC" ▪ Set model mode to 'Price Determination' ▪ Use 'StoreValues' macro to calculate and store various profiles using the iterative process ▪ Restore the original 'Tax Mode' inputs for all scenarios in **Scenario** ▪ Calculate and store Grossed up tax and working capital ▪ Use 'StoreValues' macro to recalculate and update the stored values in **Macro** ▪ Calculate price smoothing adjustment to the TRS income to achieve smooth prices ▪ Calculate and store New debt drawdown profile for the live scenario in the model ▪ Set model mode to 'Outturn' Use 'StoreValues' macro to calculate and store various profiles using the iterative process
Activation mechanism	The macro is used as part of the 'Store_DC_Initialise' subroutine.

StoreValues

Sub routine name	Solve
Module name	Mod_StoreDC
Purpose	The macro is used to automatically update the data stored in **Macro** sheet for the active scenario.
Function of macro	This macro performs iterative calculations by using the copypaste loop for the following calculations, and is dependent on the active scenario and active model mode (Price determination/Outturn): ▪ Determined cost profile - UKATS, Oceanic, LA

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Sub routine name	Solve
	- CSM profile - Oceanic ADSB - Oceanic SBC - Oceanic Atlantic - ADSB Tango - RAB - UKATS, Oceanic - Depreciation - UKATS, Oceanic - Regulatory return - UKATS, Oceanic
Activation mechanism	The macro is used as part of the 'Solve' subroutine.