ORS Fees Model Test

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25 August 2021

ORS fee setting model – methodology and model testing

Dear Brian

In accordance with the CSO dated 18 May 2021, we have attached our report summarising the outcomes and observations arising from our testing of the Office of Regulation Safety Fees Review model (the model). Our report should be read in conjunction with the important notice set out in Appendix A.

We appreciate the time and effort that you and your colleagues have spent assisting us during this work.

If you would like to discuss any specific details of points raised in this document, please give me a call and I will be happy to answer any questions.

Yours sincerely

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Agenda

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Executive Summary

Executive Summary

Background and Purpose

The Ministry of Health's (the Ministry) Office of Radiation Safety (ORS) is undertaking a review of the fees payable for activities / services administered under the Radiation Safety Act 2016 (the Act) and the Radiation Safety Regulations (the Regulations).

The ORS is seeking support to test its fee setting model that is being used to inform the review. The key observations highlighted during the ORS fee setting model test are split into two sections and are set out below:

Methodology assessment

Generally, the approach used in the ORS fee setting process appears reasonable and consistent with the methodology used to set fees and the requirements under the Act. Potential improvements to the approach used in the model include:

- allocating the memorandum account deficit in proportion to the benefits which would have been received from discounted fees in previous periods, rather than an equal fee allocation
- further consideration of the rounding of the authorisation and application volumes which impacts the allocation of fees between licence categories
- alternative approaches for the current memorandum deficit recovery treatment to smooth the impact of the recovery approach following the six year period of the model.

We note that these improvements have been considered by the Ministry team in developing ORS fees and have discussed with the team.

Model testing

The model testing highlighted that the overall calculation logic of the model appears consistent with the methodology used to set fees.

However, the test did identify:

- several minor calculation issues, which could potentially cause errors in the model
- aspects of the model that could better reflect spreadsheeting best practice, improving transparency and usability.

All issues identified have been raised with the ORS. There were no further issues that suggest the model is not mathematically viable.

Summary

If the proposed methodology changes are implemented, and calculation issues identified in the model testing are corrected, there are no further matters that came to our attention that suggest that the model is not 'fit for purpose'.

Ministry response and feedback

Following the issuance of our draft findings, the Ministry has subsequently made changes to its modelling approach.

In relation to the three potential methodology improvements identified to the left, adjustments have subsequently be made in line with the first and second bullet points but will maintain the assumptions within the third and re-examine the appropriateness in future fees reviews.

The Ministry has noted the observations arising from the model testing, and will make adjustments in line with our recommendations.

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Introduction

Introduction

Background

The ORS is undertaking a review of the fees payable for activities / services administered under the Act and the Regulations. The fees review will use the fees setting model to make recommendations on any appropriate changes to the fees set under the Regulations.

The review of fees payable is focusing on:

- the current fees
- verfiying compliance with the Act's radiation safety requirements
- amending a small number of minor technical areas of the Regulations.

PwC has been engaged to provide an independent test of the model's methdology, assumptions and arithmetical accuracy as part of this review.

Purpose and scope

The model was tested by conducting the following stages:

- *Methodology assessment* – review of the broad approach and rationale underpinning how the ORS is calculating the cost of its fees for different licence / consent types.
- *Model testing* – testing the model to assess the logic of the modelling against the methodology, identifying potential calculation errors and testing that the assumptions flow through the model as intended.

Further detail on each stage is set out in the associated sections of this report.

Out of scope

As part of the model testing engagement, we have not tested the accuracy of the inputs and assumptions used in the model. The responsibility for the reliability, accuracy and completeness of all inputs and assumptions remains with the Ministry.

Limitations

The model testing procedures completed as a part of this engagement have been carried out with the objective of supporting an overriding conclusion that, based solely on the work carried out, no matters have come to our attention to suggest that the model is not mathematically reliable. However, it is not practicable to test a model to an extent whereby it can be guaranteed that all errors have been detected and accordingly we give no such guarantee.

Appendix B provides detail on the model testing procedures completed.

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Methodology assessment

Methodology assessment overview

Overview

This stage of the model testing assesses the logic underpinning the modelling approach and tests the robustness of the thinking, considering fee setting guidance and the requirements of the Act.

Fee setting within a government context is fundamentally about adopting an approach that aligns and attributes delivery costs of an agency to the services that it is responsible for. These costs are used to allocate a charge to users that reflects the costs of delivering individual services in a transparent and equitable manner.

Our approach to assessing the methodology

The model's purpose is to calculate the cost to provide activities / services administered under the Act and the Regulations. The model is used to inform the fee set for different licence / consent types to cover these costs incurred by the ORS.

This methodology assessment considers the approach used to estimate the cost per licence type. Specifically, this stage included:

- obtaining a high-level understanding of the approach through discussions with key internal stakeholders
- obtaining a high-level understanding of the Act
- assessing the logic behind the approach
- assessing the approach against best practice principles and guidance.

Section structure

The methodology assessment is split into the following subsections:

- *Model methodology* (slides 10 - 13) – describes the modelling approach to estimate the fee for each licence / consent type
- *General observations on methodology* (slide 14) – highlights observations on the general logic used to calculate the fee per licence / consent type, as well as identifying potential improvements to the logic.

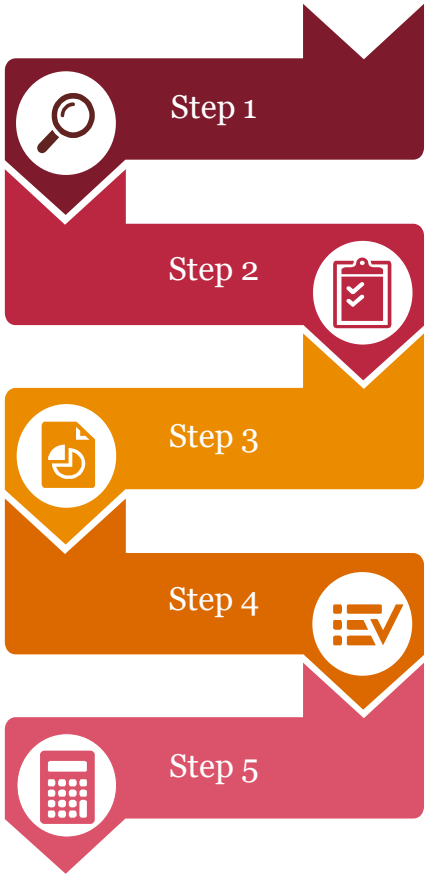
Summary

Generally, the approach used in the ORS fee setting process appears reasonable and consistent with the methodology used to set fees and the requirements under the Act.

If the proposed methodology changes are implemented, there are no further matters that came to our attention that suggest the model methodology is not 'fit for purpose'.

Our understanding of the model methodology

Figure One: Fee setting model approach



Estimates the cost of different cost categories over a six year period	✓	The costs are categorised into Total ORS Operating Costs, ERS - Contracted compliance verification services and ERS contracted scientific support services (authorisations). A memorandum account recovery is also included to restore the projected account balance to zero.
Calculates the average of each category over the six year period	✓	The costs for each year from FY2021/22 to FY2025/26 are then averaged for each category to calculate the annual amount to be recovered by fees over the period.
Calculate the average hours per inspection for each source licence category	✓	The total time per inspection is calculated for each source licence type and this is averaged to calculate the category average. These inspection hours are used in the allocation of the contracted compliance verification services costs.
Allocate each cost category to each source licence category (both new and renewals), use licences and consents	✓	Each cost category allocation is driven by different factors including an event split, time per inspection time per application and time per application
Combine each cost category fee component for each licence type / consent to calculate the annual fee per authorisation	✓	Each cost category allocation is then added together for each licence or consent type, to calculate the annual fee per authorisation. This fee is then multiplied by the projected authorisations to calculate the total take by category.

Model methodology (steps 1 - 2)

Each step in the diagram on the previous slide is set out in more detail on this slide and the following two slides.

1. Estimates the average cost for different cost categories over the six year period

Step 1 is calculated on the 'Recoverable Costs 2022-2028' tab of the model.

ORS has allocated its costs into the following cost categories

- Total ORS Operating Costs including:
  - Personnel costs
  - Standard operating costs
  - Contracts and overheads
- ESR – Contracted compliance verification services
- ESR – Contracted scientific support services (authorisations)
- Memorandum Account Clearance

Growth rate assumptions are applied to current year costs for relevant line items to account for growth in wage and the Consumer Price Index (CPI) over the six year period.

A total cost for each category is calculated from the current year to FY26/27.

2. Calculates the average of each category over the six year period

An average of each of the cost categories annual cost over the six year period from FY2021/22 to FY2026/27 is then calculated.

These average annual values are the amount to be recovered for each cost category through the fees charged for the different licence / consent types in the model. The allocation drivers for each cost category are explained in Step 4.

To clear a $1.2 million memorandum account deficit over the six year period, an annual $200,000 memorandum account clearance is assumed.

The sum of the averages of each cost category and the annual memorandum account recovery is calculated as the total annual cost to be recovered over the six year period. This is the total take from all licence and consent types in each year.

Model methodology (steps 3 – 4)

3. Calculate the average hours per inspection and number of authorisations for each licence / consent category

The average hours per inspection for each source licence category is calculated using Table 3 on the 'Inspect Data' tab of the model by completing the following steps:

- the total minutes per inspection for each activity (eg Radiotherapy) is calculated by adding together the time required for Pre On-site inspection, On-site inspection, Travel and Admin
- the average of the different activities making up for each source licence category (eg M1) is calculated
- this average time per source licence category is converted from minutes to hours
- the total time per licence category by inspection frequency is then calculated as the average of the inspection time of the licences types in the category (eg Medical 1, Non-medical 1, Non-medical 2 comprise 1 yearly inspections).

The model calculates the number of authorisations based on the average of actual authorisations in November 2020 for the authorisation licences comprising each licence / consent category.

The number of applications for each licence / consent type is then calculated by multiplying the number of authorisations by the ratio of total applications to authorisations (based on November 2020 data).

The total category authorisations is then allocated:

- *Source licences:* 5% to new / variations, and 95% to renewals / no variations
- *Use licences* - 10% to new / variations, and 90% to renewals / no variations.

4. Each cost category is then allocated to each source licence category (both new and renewals), use licences and consents

Each cost category (from Step 1) is then allocated to each source licence, use licence and consent type using the following methodology:

Memorandum account recovery

The memorandum account recovery is allocated to all source licence categories (both new and renewals) evenly resulting in a fee component of $85 per authorisation. Use licences and consents do not incur an additional fee component for the memorandum account recovery.

ESR science advice volume to fee

The cost for scientific support for regulatory decisions is driven by the time required per authorisation for each source licence, use licence and consent type.

The time required for new / variation licences and high-activity single event consent authorisations is greater than the time required for renewals / authorisations with no variation. The result is that new / variation licence types and high-activity single event consents incur a larger proportion of the scientific support for regulatory decisions cost to fee per authorisation.

The relevant fee per authorisation is multiplied by the number of authorisations for each licence or consent category to calculate the total annual fee take for each category.

Model methodology (steps 4 continued – 5)

ESR inspection volumes to fee

The cost of inspections, compliance verification and other risk management activities is allocated to source licences only. The fee allocation for this cost category is driven by the time per inspection.

The category average time per inspection (calculated in Step 3) is multiplied by the number of inspections per year to calculate the annual hours required for inspections for each source licence type.

The time per inspection, and therefore the fee per authorisation, is the same for new / variation source licences compared to renewal / no variations.

The hours per year drives the allocation of the cost category to calculate the proposed fee take per year. This value is divided by the number of inspections per year to calculate the proposed fee per inspection. The fee per year for each source licence category is then calculated by multiplying this value by the inspection rate per year.

ORS volumes to fee

The cost allocation for annual applications administration is driven by the time per application. The time required is higher for new / variation licences compared to renewal / no variation licences.

The relevant time per application is multiplied by the number of authorisations for each licence and consent category to calculate the total annual time. This is used to allocate the annual cost category recovery to calculate the proposed annual take for each licence category. This value is then divided by the number of authorisations to calculate the annual fee component per authorisation.

5. Each cost category fee component is then combined for each licence type / consent to calculate the annual fee for each type per authorisation

The following step is calculated on the 'Proposed Fees' tab of the model.

The annual fee component from each cost category and the memorandum deficit, for each licence and consent category, is summed together to calculate the total proposed annual fee.

This proposed annual fee is then multiplied by the projected number of authorisations to calculate the total annual take by licence / consent category. This step is repeated for all new source licence types, renewal source applications, use licences and consents.

The sum of the annual take for all categories is equal to the average annual cost over the six year period.

Methodology: general observations

Figure Two: General Observations

1 Even allocation of memorandum account recovery charge

The model currently allocates the memorandum account deficit evenly to all source licence types. This rationale was discussed with the ORS team who confirmed the variance in the memorandum account related only to source licence activity, and not to use licences or consents.

The ORS team is also considering the appropriateness of applying a constant percentage increase to each source licence fee.

2 Model rounding of authorisation and applications volumes

Both authorisation and application volumes are rounded to calculate a whole number. While in practice you can not have partial applications or authorisations, given this is a category average for calculation purposes, the rounding will impact the proposed fee allocation between the source and use licence categories. This impact will be larger for categories with small authorisation volumes.

Calculations will more accurately reflect the number of authorisations and applications if the rounding function is not used. In discussions with the Ministry it was noted that this rounding is using estimates based on historical data, and therefore subject to potential variability.

3 A further fee adjustment may be required after the six year period

By incorporating a memorandum account deficit recovery over the six year period, the fees set will be higher than the ongoing cost of providing activities / services administered under the Act and the Regulations. The memorandum account fee component will likely be greater than the growth in cost over the six year period. The ORS team are aware that a downwards adjustment in the fee may be appropriate at the end of the six year period.

4

Model testing

Model testing

Overview

The second stage examines the Excel model used to execute the fee setting methodology on a cell-by-cell basis. Key activities completed in this stage included:

- obtaining a high-level understanding of the model, how it was constructed and its purpose
- checking whether the calculations in the model appear in all material respects logical, internally consistent and arithmetically correct
- checking whether the model's overall functionality appears to align with the purposes for which the model has been developed.

Further details on the testing procedures and limitations of the model testing procedures are set out in Appendix B.

Observations

The model testing procedures indicate that the overall logic and calculations in the model appears consistent. However, the test identified several areas for improvement, as well as sections that are potentially prone to error.

The individual instances are set out in Appendix C, but they are generally themed into the following categories:

- Hard coded values
- Inconsistent formula within the same section
- Inconsistent use of assumptions
- Misleading labelling and titles
- Unused inputs and calculations
- Minor calculation errors

Note that the points in Appendix C do not detail the major logic observations. These are highlighted in the methodology assessment of this report.

If the identified errors are corrected, there are no further matters identified that suggest the model is not arithmetically viable.

Model testing

Summary of Observations

The following table summarises the issues identified and provides general recommendations on how to correct for or avoid such issues in the future.

Issue identified	Recommendation
Hard coded values are used within formulae	Hard coded values within formulae increases the risk of updates to assumptions not being correctly reflected throughout the model. Dynamic inputs will allow the model user to more easily follow what hard coded values in formula are referring to, while also allowing the flexibility to adjust inputs in a single location.
Inconsistent formulae within the same section	There are a number of instances in the model where the formula changes across a row or between similar sections. While in the model we did not observe any instances where this impacted the calculations and therefore the model outputs, best practice would be for formulae to be consistent across rows to limit the potential for errors.
Inconsistent use of assumptions	Growth rate assumptions have not been applied consistently in the model. All growth rates should be applied to current rates unless there is a specific reason why a different approach has been taken. Ideally the reasoning for this alternative approach should be explained for other users.
Misleading labelling and titles	Descriptive titles describing the rates and frequency of inspections should be updated to remove any ambiguity to the model user about what information is being displayed. This will reduce the risk of future errors from incorrect entry of information if inputs or assumptions are updated in the model.
Unused inputs and calculations	There are several calculation blocks in the model that do not contribute to the model outputs. While in some cases providing additional context and useful comparisons, these should be clearly signalled as additional information.
Minor calculation errors	There were a number of instances in the model where formulae were incorrect. None of these observations impact the model outputs as they are currently calculated.

Appendix C sets out each of the observations in the model in more detail.

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Appendices

Appendix A: Important Notice

This report has been prepared by PricewaterhouseCoopers Consulting (New Zealand) LP (PwC) for the sole use of the Ministry of Health (the Ministry), to summarise the results of the testing of the ORS fees setting model. The report has been compiled based on instructions received from the Ministry and information provided by MoH. We accept no liability to any party should it be used for any purpose other than that for which it was prepared.

This document is strictly confidential and (save to the extent required by applicable law and/or regulation) must not be released to any third party without our express written consent which is at our sole discretion.

To the fullest extent permitted by law, PwC accepts no duty of care to any third party in connection with the provision of this report and/or any related information or explanation (together, the “Information”). Accordingly, regardless of the form of action, whether in contract, tort (including without limitation, negligence) or otherwise, and to the extent permitted by applicable law, PwC accepts no liability of any kind to any third party and disclaims all responsibility for the consequences of any third party acting or refraining to act in reliance on the Information.

The analysis and findings in the report rely upon the information provided by MoH as well as assumptions that have been discussed and agreed upon with MoH through the course of our engagement. All assumptions will be the sole responsibility of the Ministry.

PwC has not independently verified the accuracy or reasonableness of information, inputs and assumptions provided to us, and have not conducted any form of audit in respect of the organisation for which work is completed. Accordingly, we express no opinion on the reliability, accuracy, or completeness of the information provided to us and upon which PwC has relied. Responsibility for the reliability, accuracy and completeness of such information remains with the Ministry.

The statements and opinions expressed herein have been made in good faith, and on the basis that all information relied upon is true and accurate in all material respects, and not misleading by reason of omission or otherwise.

The statements and opinions expressed in this report are based on information available as at the date of the report.

We reserve the right, but will be under no obligation, to review or amend our document, if any additional information, which was in existence on the date of this report was not brought to our attention, or subsequently comes to light.

This report is issued pursuant to the terms and conditions set out in the signed Consultancy Services Order dated 18 May 2021.

Appendix B: Model testing procedures

Model testing procedures

The tests completed are in relation to the model's mathematical accuracy and have not determined the appropriateness of the data used in the model. The specific model assessment tasks are split into the following categories:

- model specification and structure
  - develop high level understanding of the nature of key operations, key risks and value drivers
- detailed testing of worksheets
  - identify all inputs, including any hard-coded inputs
  - assess key calculation logic and consider reasonableness
  - formulae checks:
    - formulae appear in correct cells (e.g. years, line items)
    - formulae copied across columns correctly (especially absolute vs relative cell references)
    - formulae contain no inputs
    - range names correct
    - identify any circular references
    - consider consistency of repeated worksheets
    - run automated testing tools
- reasonableness of output
  - high level consideration of the reasonableness of the model's outputs given the input assumptions
- assumptions
  - identify where equivalent input assumptions are repeated and check on a test basis that they contain the same values.

Further Limitations to the model testing prodecure

- Our work does not include any work in the nature of a financial audit and we do not verify any of the assets or liabilities involved
- We make no comment on how closely the results actually achieved compare with the projections in the model
- We have not reviewed the projections produced by the model, or made any comment in any form on the outputs produced by the model, other than to confirm that the outputs generated by the model appear to be consistent with the input assumptions for the input assumptions considered
- We have not checked whether the accounting assumptions and outputs from the model are in accordance with New Zealand Generally Accepted Accounting Principles (GAAP).

Appendix C: Model testing observations

Appendix overview

This appendix summarises the issues identified while completing the model testing procedures. Note that the observations raised in the methodology assessment section of this report have not been repeated in this model testing observations section.

Also note that observations from the workings section on the 'Recoverable Costs 2022-2028' tab, which have been used as a reference point only and not for the purpose of fee modelling, have not been included in this appendix.

Issues from hard codes

Item	Sheet	Cell	RAG	Explanation
Dynamic growth inputs	Recoverable Costs 2022-2028	D4:I7, E11:I16, D20:I21, D27:I27, D28:I28		Currently the model calculates growth using hard coded percentages. Best practice would be to have a dynamic input for each growth rate. This reduces the chance of error if growth rate assumptions were to be updated.
Current year personnel costs are hard coded	Recoverable Costs 2022-2028	C8		The value for current year personnel costs is a hard coded calculation which is difficult for a model user to track. The Ministry clarified this cost is calculated outside the model. As the current year values are not included in the calculation, this observation does not impact the model outputs.
Hard coded percentage allocations between new and renewal licences	ORS volumes to fee	C4:C25		The percentage allocations between new / variations and renewals / no variation source and use licences is hard coded. Best practice would be to use a dynamic input as hard coded values in formula increase the chance of errors in the event that assumptions change.

RAG Key

Red - Material error which needs correcting
Amber - Issue that could result in a material error
Green - Not material, but should be corrected

Appendix C: Model testing observations

Appendix overview

This appendix summarises the issues identified while completing the model testing procedures

Inconsistent formula, labels and use of assumptions

Item	Sheet	Cell	RAG	Explanation
Inconsistent application of growth rates	Recoverable Costs 2022-2028	E11:E16, E20:21		Personnel cost growth is applied from 2021/22 whereas operating cost and contract and overheads growth is applied from 2022/23. All growth rates should be applied to current year values.
Unclear headings	ESR inspection volumes to fee	D2:E2		The current headings in the model could be misleading to a model user. The headings should read number of inspections per the time period rather than the inspection rate.
Inconsistent formula across the row	ESR science advice volume to fee	G28		Best practice is to have consistent formula across a row to reduce the chance of mistakes from variations in calculation method. In this case the dissimilar formula results in the same calculation so model outputs are not impacted.
Inconsistent formula between similar blocks	Proposed fees	G25:26, G31:33, I25:26, I31:33		Best practice is to have consistent formula between similar calculation blocks. While the correct values are obtained, the cells from the cost allocations sheets that are referenced are from inconsistent columns between source licences and the use and consent licence calculation blocks. To correct this would require consistency between cost allocation calculation sheets.

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Green - Not material, but should be corrected

Appendix C: Model testing observations

Appendix overview

This appendix summarises the issues identified while completing the model testing procedures.

Minor calculation errors

Item	Sheet	Cell	RAG	Explanation
Incorrect formula for recovery over 3 years	Recoverable Costs 2022-2028	H102		The calculation for recovery over 3 years references a blank cell for the denominator. This cell should calculate a three year average for it to be a meaningful measure.
Sum ranges including additional cells	ORS volumes to fee, ESR science advice volumes to fee, ESR inspection volumes to fee, Proposed fees	Multiple instances		Sum ranges include additional cells. Although no calculations are affected, there is a risk of calculations being impacted if these extra cells are not blank.
Incorrect formula	ORS volumes to fee	F10, F19		These calculations will only calculate the correct values when the time per application is the same for all the licence types in each block. This formula should be changed to sum the cells above for each block.

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Appendix C: Model testing observations

Appendix overview

This appendix summarises the issues identified while completing the model testing procedures.

Minor calculation errors

Item	Sheet	Cell	RAG	Explanation
Sum range too short	Proposed Fees	C28		This sum formula should also include cell C25 for new use licences. Given the value for this sum is zero the model outputs are not impacted.
Incorrect calculation	Auth Data	N10:N25		This calculation incorrectly uses the discount applied fee where the value calculated states it should have no discount applied. There are no dependents on these values so the model outputs are unaffected.
Inconsistent formula	ESR science advice volumes to fee, ORS volumes to fee	I10, I9		The formula for the calculation of the proposed annual fee changes down column I for the row showing 'no inspections' for new source licences. If the formula was copied down correctly then this fee component would result in a proposed annual fee of $0. As there are no authorisations for 'no inspections' this does not impact the model outputs.
Linking to blank cells	Proposed fees	I25:26, I31:33		These cells reference blank cells on the 'memorandum account vol to fee' tab. The model outputs are not affected as the correctly linked cell would not pull through any fee component to allocate.

RAG Key

Red - Material error which needs correcting
Amber - Issue that could result in a material error
Green - Not material, but should be corrected

Thank you

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