



INFORMATION TECHNOLOGY AUDIT

OF

THE TRADE AND QUALITY INFRASTRUCTURE DIVISION:

ELECTRONIC FUEL PRICE CALCULATOR
2010-2019



Office of the Auditor General
September 2021

ELECTRONIC FUEL PRICE CALCULATOR

This is a Report of an
Information Technology audit
conducted by the Office of the
Auditor General.

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Office of the Auditor General
24 September 2021



PREAMBLE

Vision Statement

To be a proactive Supreme Audit Institution that helps the nation make good use of its resources.

Mission Statement

The O.A.G is the national authority on public sector auditing issues and is focused on assessing performance and promoting accountability, transparency and improved stewardship in managing public resources by conducting independent and objective reviews of the accounts and operations of central government and statutory agencies; providing advice; and submitting timely Reports to Accounting Officers and the Legislative Assembly.

The Goal

To promote staff development, enhance productivity, and maintain a high standard of auditing and accounting in the public sector, thereby contributing to the general efficiency and effectiveness of public finance management.

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AUDITOR GENERAL'S OVERVIEW

With the advancement of technology, the Government of Montserrat's Ministries and Departments have become increasingly dependent on utilising information systems to perform key functions. In an effort to provide efficient ways to calculate the price of fuel, a Microsoft Excel spreadsheet was designed to capture the basic formula stated within the price of goods ordered.

Our review revealed that the implementation of the fuel price calculator is governed and operates in accordance with the Statutory Rules and Order's 53/2005 and 11/2009 as prescribed in the Distribution & Price of Goods Act to grant the Government of Montserrat more control of the fuel prices. The model is utilised to obtain the distribution, retail and duty-free prices of gasoline and diesel and records the movement and stock of fuel on the island. The calculator's computations are precise, whether or not correct information is inputted.

Over the years, periodic confirmations of the dip stick measurements of retailers' storage tanks were not executed. The two main reasons for this prolonged non-compliance were [a] the vacancy of the Trade and Quality Infrastructure Officer Post for a number of years and [b] incomplete training of the recruited Trade Officer on the physical aspects of the job. The Trade and Quality Infrastructure Division has a practice of estimating the levels of fuel in the storage tanks at the two service stations and the metrics of the tanks are said to be unknown. There is also the issue of gasoline loss due to evaporation. Working loss in gasoline storage tanks is due to the combined effects of gasoline delivery to the storage tanks (the filling of storage tanks) and the emptying operation (the pumping of gasoline from storage tanks to the dispensers/gas pumps). As a result, we have determined that this estimation does not reflect an accurate quantity of petrol retailers' fuel stock or the cost of fuel on Montserrat.

Subsequent to our review, we were apprised that a Trade and Quality Infrastructure Officer was appointed in August 2020. However, over a year later, the dip stick measurements are still not being performed.

I am further recommending that the Government of Montserrat engage an independent technical consultant or expert to assess the entire fuel supply chain, storage, measurement and pricing and any other aspect of this monopoly in the public interest.

I wish to thank the staff of the Trade and Quality Infrastructure Division, other participating Departments and Organisations, and all other persons who provided information, clarifications or extended any courtesy to my staff during this assignment.



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Auditor-General (Ag)
24 September 2021

ABBREVIATIONS

CIF	Cost Insurance Freight
EFP	Electronic Fuel Price
GoM	Government of Montserrat
HRMU	Human Resources Management Unit
MoFEM	Ministry of Finance and Economic Management
ISAE	International Standard Assurance Engagements
ISSAI	International Standard of Supreme Audit Institutions
IT	Information Technology
MATLHE	Ministry of Agriculture, Trade, Lands, Housing, and the Environment
MUL	Montserrat Utilities Limited
OAG	Office of the Auditor General
SR&O	Statutory Rules and Orders
TQI	Trade and Quality Infrastructure

EXECUTIVE SUMMARY

Overview

The Trade and Quality Infrastructure (TQI) Division designed an Excel spreadsheet tool called the Electronic Fuel Price Calculator to capture the basic formulae for the computation of the Prices of Goods (Petroleum Products) on Montserrat, stated within the *Statutory Rules and Orders 53/2005* (SR&O). This Information Technology audit was conducted to determine if the accuracy and consistency of the fuel prices computed by the Calculator are in accordance with the Laws of Montserrat.

Key Observations

- The formulas and functions set up in the Excel Spreadsheet based Electronic Fuel Price Calculator, are in accordance with the *Montserrat Statutory Rules and Orders 53/2005*.
- The fuel price calculations are consistent and accurate, whether or not precise information is keyed into the calculator.
- The TQI Division had lacked the required staff, a TQI Officer, to perform the relevant fieldwork of capturing dip stick measurements of the fuel storage tanks. A critical responsibility of the TQI Officer is to monitor and report on local trade practices and fuel supply to ensure customers are not misled and to ensure the adherence to the pricing mechanisms established by the Government of Montserrat. The Division has been averaging the levels of fuel for over nine (9) years. Subsequent to this review, we were informed that a TQI Officer was appointed and would be trained to perform the technical requirements of the post. However, to date, training of the TQI Officer has not been completed, nor has the Officer been conducting dip stick measurements.
- A directive was issued by the Cabinet in June 2019 instructing the Ministry within which the Trade Division operates and the Ministry of Finance and Economic Management to review the accuracy of the fuel price calculations but this was not actioned. However, subsequent to this review, the Ministries finally commenced a collaborative assessment exercise in September 2021.

Audit Conclusion

The Office of the Auditor General has determined that the EFP Calculator is in compliance with *SR&O 53/2005* and is consistent and accurate. The post of Trade and Quality Infrastructure Officer was recently filled, the employee has not conducted any physical tank dip measurements. Therefore, until the Officer is trained to execute this task, the current practice of estimation misrepresents the fuel stock of Petrol Retailers (positively/negatively) and ultimately affects the price of fuel. The inputs into the calculator are dependent on a process that is inherently subjected to error and is further compounded by the length of time that this situation has elapsed.



CHAPTER 1 INTRODUCTION

1. The Trade and Quality Infrastructure Division (TQI), is responsible for the computation of the Prices of Goods (Petroleum Products) on Montserrat using Microsoft Excel spreadsheet called the Electronic Fuel Price (EFP) Calculator. This spreadsheet calculator was designed to capture the basic formula stated within the Statutory Rules and Orders (SR&O) 53/2005; it was created following a directive by Cabinet in 2005.¹

Audit Objectives

2. The main aim of this Information Technology (IT) audit is to establish if the Microsoft Excel Spreadsheet Electronic Fuel Price (EFP) Calculator has proper application controls in place to ensure the completeness, accuracy, and consistency of the calculated Petroleum Products prices.

3. Therefore, the objectives of the audit are to:

- (i) Determine whether the formulas in the EFP Calculator are in accordance with the SR&O 53/2005 and SR&O 11/2009.
- (ii) Determine whether the EFP Calculator formulas and the Petroleum Products calculated prices are consistent and accurate.

Management Responsibility

4. Management is responsible for ensuring that appropriate policies and effective controls exist. More specifically, management must ensure that policies and controls exist to ensure and protect the accuracy, integrity, reliability, and confidentiality of the EFP Calculator information.

Auditor's Responsibility

5. Our responsibility is to independently express a conclusion on Application Controls for the Ministry of Agriculture, Trade, Lands, Housing, and the Environment (MATLHE) and subsequently, the Office of the Premier, based on our audit. Our work was conducted in accordance with ISSAI 100, 5300, and ISAE 3000. These principles require that we comply with ethical requirements and plan and perform the audit in order to obtain reasonable assurance whether tried and true policies, procedures, and internal controls exist and are functioning effectively, proper records have been and are being kept, and all the necessary information and explanations for the purpose of our audit, has been obtained.

Audit Mandate

6. The Office of the Auditor General (OAG) is mandated through the Montserrat Constitution Order 2010 to perform the audit. This mandate is supported by International

¹ *TERMS OF REFERENCE, Trade and Quality Infrastructure Division, Ministry of Agriculture, Trade, Lands, Housing and the Environment, Brades, MONTSEERRAT - An Audit of Government of Montserrat Fuel Price Calculator and the Development of a National Fuel Pricing Policy.*

Standard of Supreme Audit Institutions (ISSAI) 1, 200, 300, 400, and strengthened by the Revised Laws of Montserrat CAP 17.07 Public Finance Management and Accountability Act (PFMAA).

Audit Standards & Guidelines

7. The standards and guidelines used to evaluate the Application Controls assessments included the use of ISSAI 1, 100, 3100, 4100, 5300, and 5310.

Audit Scope and Methodology

8. The study covered the period July 2010 - July 2019 and focused on the examination of the policies, procedures, and controls that guide the Application Controls for the EFP Calculator.

9. A combination of techniques was utilised to gather information and to assess the existing procedural controls, and determining if they were effective in ensuring that there is accuracy and consistency of the EFP Calculator formulas and computations. These included interviewing of the stakeholders and users that previously operated under the Ministry of Agriculture, Trade, Lands, Housing, and the Environment portfolio (Trade and Quality Infrastructure Division now falls under the remit of the Office of the Premier). Other techniques applied included inspection of documents and observation of the EFP Calculator, in order to gather in-depth information about the tool.

10. The findings of this report were discussed with the Principal Trade and Quality Infrastructure Officer; her views were taken into consideration when finalising the report.

CHAPTER 2 ELECTRONIC FUEL PRICE CALCULATOR

Basis of the Calculator

11. ²The Electronic Fuel Price (EFP) Calculator was developed in 2007, to calculate two (2) specific computations:

- (i) **Landed Cost of the Fuel** - which includes all the tax/duty in relation to the newly imported fuel; specific formulas are used to arrive at the cost.
- (ii) **Existing Fuel on Ground Incorporated with Newly Imported Fuel** - which is the previous shipment of fuel that will be mixed with the new/fresh shipment. Therefore, in order to prevent against any losses or excessive gains, the amended quantity of the residual fuel in the storage tanks at both gas stations, and at the Delta depot, and the date of each new delivery/shipment are used. This re-calibration includes the losses due to eventual evaporation, against the tank dip records from Delta Petroleum (Montserrat) Ltd.

Legal Framework and Computation of Fuel Prices

12. ³The legal frameworks that govern the EFP Calculator are *Statutory Rules and Orders (SR&O) 53/2005, SR&O 11/2009* and *CAP 6.03, Distribution & Price of Goods Act*. The Montserrat Statutory Rules and Orders (SR&O) No. 53, Price of Goods (Petroleum Products) Order 2005 came into effect in August 2005, as a means to grant the Government of Montserrat (GoM) more control over the price of fuel. Given the monopoly market for fuel on Montserrat, Government intervention became necessary to safeguard the interests of consumers in regards to pricing. Consequently, the GoM issues the maximum wholesale/retail prices that distributors must comply with.

13. According to *SR&O 53/2005*, the calculation of fuel prices are to be as follows:

A. Landed Cost

Landed Cost = Cost Insurance Freight (CIF) + Duty + Consumption Tax + Service Tax

14. The Landed Cost includes the cost of the goods free on board at the port of origin, together with freight charges; insurance costs while the goods are in transit; cost of packing the goods for transit; customs duty and consumption tax payable on importation of the goods; and bank charges (if any), directly relating to the importation of the goods.

B. Whole Sale Price Formula

Whole Sale Price = Landed Cost + Dealer's Margin

C. Retail Price Formula

² Revised Electronic Fuel Price Calculator (V.2) User Manual

³ Montserrat Statutory Rules and Orders, NO.53 OF 2005

Retail Price = Whole Sale Price + Distributors' (Retailers') Margin

D. Market Price

Landed Cost + \$0.06 = Market Price

15. In 2010, Cabinet introduced an implementation cost of \$0.06 per gallon, to cover the shared fuel depot development cost that was agreed between the GoM and Delta (Montserrat) Petroleum Ltd.⁴

⁴ EXCO. MEMO NO. 2010/54, DATE: 31 March 2010, BY HON MINISTER OF FINANCE, ECONOMIC DEVELOPMENT & TRADE
- FINANCING OF OUTSTANDING BALANCE OWED TO DELTA AND FOR THE PURCHASE OF A NEW TANK WAGON

CHAPTER 3 APPLICATION CONTROLS

Application Security

16. The Principal Trade and Quality Infrastructure Officer, is the main authorised person who has access to, and administers, the current working version of the EFP Calculator. The Honourable Minister and Permanent Secretary (PS), only have templates of the EFP Calculator; not the current working version. The working version is stored on the Division's H: drive and a portable hard drive is in the possession of the Principal TQI Officer; hard copy files of the various calculations are also kept for every calculation issued.

17. The EFP Calculator, however, is not password protected against unauthorised access should the portable hard drive fall into the wrong hands.

Input Controls

18. The Principal TQI Officer has to manually insert certain pieces of information into the EFP Calculator such as: (i) current date, (ii) data from Delta Petroleum Ltd.'s Invoices, (iii) physical tank dip measurements from Delta and both Petrol Stations, and (iv) data from the ocean tanker's Discharge Sheets. Otherwise, the most recent fuel price computations are copied and pasted above the last set of calculations.

19. Historical data is also repeatedly copied from the different worksheets, in the same EFP Calculator Excel workbook file, as follows:

- Price Build Up
- New Fuel Price
- Unit Cost
- Gasoline IMP (Regular)
- Gasoline IMP (Premium)
- Diesel IMP (Regular)

20. The Principal TQI Officer indicated that the practice of copying and pasting the historical data will be eliminated in the revised version of the calculator. This historical information, along with the new computations, will be setup to automatically filter into the other worksheets.

Processing Controls

21. Fixed formulas and functions have been set up in the EFP Calculator worksheets, to calculate the *New Fuel Prices*. These formulas and functions cannot be changed unless instructed by a Cabinet Directive.

Output Controls

22. Duplicate hard copies of the various work sheets are printed and one set is filed away at the TQI Division, and the other set sent to Delta.

CHAPTER 4 OBSERVATIONS

Observations

23. **Excel Spreadsheet EFP Calculator is compliant with the law, consistent, and accurate.** The formulas and functions set up in the calculator are in accordance with the *Statutory Rules and Orders 53/2005* and *SR&O 11/2009*. The fuel price calculator is consistent and accurate, whether or not precise information is keyed into it.
24. **Lack of Error Detection and Notification.** The Excel spreadsheet EFP Calculator does not have controls in place to guard against errors; or protect the formulas and the integrity, validity, and reliability of the inserted data. It also cannot alert the user when incorrect information has been inserted, or ensure that the calculations are accurate.
25. **Risk of Unauthorized Access and Modification.** The EFP Calculator is not a secure program; access to the Excel workbook and the formulas and functions, is not password protected. However, the Principal TQI Officer is already aware of the issue and is currently working on the development of an improved version of the EFP Calculator, which should eliminate the above risks and to make it more secure. The department is in the process of incorporating certain Excel security features that will protect the data in all of the EFP Calculator work sheets. Specific cells and cell ranges will be locked to protect data and hide formulas from being modified or deleted.
26. Only authorised users of the calculator would be able to gain access to specific locked cells and ranges in the worksheets, via a 3-Tiered Password Protection system. At each level authorised users will be restricted to performing certain sets of tasks in assigned locked cells and cell ranges. Once they do not have access to perform tasks in the locked areas of the various worksheets, they would only be able to view the data.



dealers Margin (Fixed)	1.75	1.75	1.75
Access Charge (Policy Changes)	0.06	0.06	0.06
Contributor's Price	13.13	10.57	11.34
Wholesaler's Markup	1.00	1.00	1.00
Wholesaler's Price	14.13	11.57	12.34
Wholesale Free Price	10.19	9.11	8.87

Figures I & II - Example of Password Box and of Locked Cells and Ranges

27. For example:

- **Levels 1 & 2** - will be for very Senior staff; they will have the authorisation to only change Directives from Cabinet level, such as:
 - Dealer’s and Retailers’ Margins, data, and any future incentive policy that the GoM institutes.
 - Rates of taxes (Import Duty, Consumption Tax, and Service Tax).
- **Level 3** - will be for the Operational staff who are the main users of the EFP Calculator; they will have the authorisation to only:
 - Input changeable data (for e.g. Date, Freight, F.O.B. Price, information from Delta)
 - Perform simple formatting task such as adjusting the size of the rows and columns, changing fonts and font colours.

Staff at this level will not be able to change or delete formulas, nor add/delete rows and columns.

28. **Inadequate TQI staffing and related issues.** The Dept. of TQI does not have the required staff to operate at its full capacity. Their ideal staff complement is three (3), but currently, the unit is only comprised of the Principal TQI Officer and a Senior Clerical Officer. The remaining post of TQI Officer has been vacant for nearly 2 years. This vacancy is a very important one, as one of this officer’s main duties is a technical one that entails going out into the field to test, record, and report dip measurements of the fuel storage tanks at Delta and both service stations.

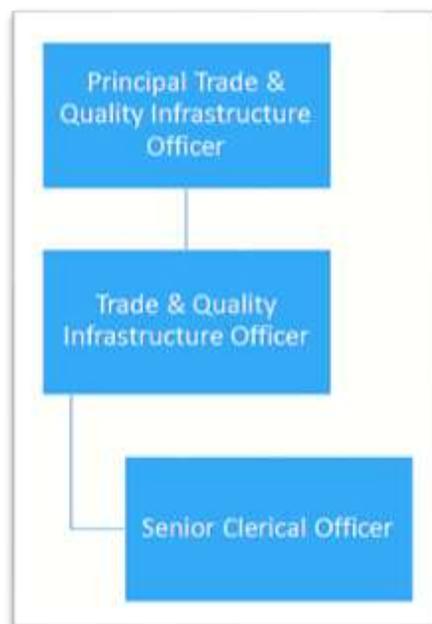


Figure III - Trade and Quality Infrastructure Division Organisational Chart

29. The Principal TQI Officer is uncertain whether the subsequent successions of TQI Officers received the required training, and if they performed this technical duty after the departure of the last trained TQI Officer around 2009. Consequently, the department has been averaging the levels of fuel in the storage tanks at the service stations; this practice of estimation does not yield a true reflection of the Petrol Retailers' fuel stock, or the cost of fuel. In addition, owing to the absence of a verification system, there is the potential for doubt to arise relating to dip measurements.

30. At the time of the audit, the Principal TQI Officer was in the process of formulating plans to fill the vacant post; and it is the intention of the department to liaise with the Human Resources Management Unit (HRMU) to either [1] hire a skilled candidate or [2] outsource the technical job function to a private entity who will be required to train an understudy from the Division.

31. **Adjustments made to the Montserrat Petroleum Products Price Build Up.** In May 2016, Cabinet approved an increase of the Retailers' Profit Margin from \$0.55 to \$0.75.⁵ A second increase was effected in June 2019 to \$1.00, in order to capture Delta's charge and to increase the Retailers' Profit Margin again, allowing for greater profits to be re-invested back into the businesses for sustainability.

32. **Cabinet directive not actioned.** A directive was issued by the Cabinet in June 2019 instructing the Ministry within which the Trade Division operates and the Ministry of Finance and Economic Management to review the accuracy of the fuel price calculations but this was not actioned for over two years.

33. **Subsequent Events – TQI staffing and related issues.** Subsequent to the finalisation of this review, the post of the TQI Officer was filled in August 2020 and arrangements were made by the Division to train the new recruit to perform the physical responsibilities of the job to include dip stick measurements at Delta Petroleum Facility and both service stations. To date, the training of the TQI Officer is incomplete and the Officer has not been conducting the required dip stick measurements.

34. **Subsequent Events – Action begun on the Cabinet decision.** The June 2019 Cabinet decision gave a directive for the Trade Division, in collaboration with the Ministry of Finance and Economic Management, to review the accuracy of the fuel price calculations. This collaborative assessment of the EFP Calculator between the Department of Trade and Quality Infrastructure and the Ministry of Finance and Economic Management & Economic Management, only commenced in September 2021.

⁵ <https://discovermni.com/2016/05/27/government-revises-fuel-margins-for-retailers/>

CHAPTER 5 MANAGEMENT RESPONSE

35. In many countries monopoly economies are typically regulated by government intervention as a means of controlling prices to manage the affordability of products. This is most commonly implemented on food and energy products. The Distribution and Price of Goods Act allows for the Ministry with responsibility for Trade to effect price ceilings for all petroleum products on Montserrat. This has been the practice for several years.

36. The Trade and QI Division has been utilising an MS Excel spreadsheet, as many other islands within the region to calculate fuel prices. The basic computation follows the stipulations outlined in SR&Os 53/2005 and 11/2009.

37. Since the audit commenced in 2019, there have been structural changes which occurred within the staffing compliment in the Trade and QI Division. The Division now has a full staffing complement, and significant strides have been made in the development of a revised EFP Calculator, taking into account security risks and user error risks through cell protection and data validation features. A guiding document has been created which details the functionality of the revised EFP Calculator. This was a new initiative to ensure continuity and knowledge preservation in the event of staff turnover.

38. The on-boarding of a permanent TQI Officer would also see the re-emergence of regular dip measurement verification systems. Further, given the 50/50 likelihood of error when engaging in data entry, calculations are carried out by one officer and subsequently reviewed by another officer to ensure quality assurance and to further minimise the margin of error.

39. The responsibility that falls on the Division to calculate these prices is of paramount importance given that petroleum products are huge drivers of our socio-economic wellbeing. It is to be noted that all efforts are taken to ensure that prices are quality checked for accuracy, issued in a timely manner, and published for the wider public.

40. Notwithstanding, the risks highlighted in this audit will be addressed where possible to ensure consistent quality assurance across the board.

Principal Trade and Quality Infrastructure Officer
Office of the Premier
October 2021

CHAPTER 6 AUDIT CONCLUSION

41. From this Information Technology (IT) review, the Office of the Auditor General has determined that the fuel prices computed by the EFP Calculator, are in compliance with SR&Os 53/2005 and 11/2010, and are consistent and precise.

42. The post of Trade and Quality Infrastructure Officer was filled, the employee has not conducted any physical tank dip measurements. Therefore, until the Officer is trained to execute this task, the current practice of estimation misrepresents the fuel stock of Petrol Retailers (positively/negatively) and ultimately affects the price of fuel. The inputs into the calculator are dependent on a process that is inherently subject to error and is further compounded by the length of time that this situation has elapsed.