

BEFORE THE GUAM PUBLIC UTILITIES COMMISSION

IN THE MATTER OF:) GPA Docket 21-17
)
The Application of the Guam Power)
Authority to Approve the Amendment to) **ALJ REPORT**
the Contract for Residual Fuel Oil No. 6)
for the Baseload Power Generating Plants.)
_____)



INTRODUCTION

1. This matter comes before the Guam Public Utilities Commission ["PUC"] upon the Petition of Guam Power Authority ["GPA"] for approval of the Amendment to the Contract for Residual Fuel Oil No. 6 for the Baseload Power Generating Plants.¹
2. GPA seeks PUC approval of an amendment to the GPA-Hyundai Corporation Contract which would require Hyundai Corporation to provide GPA with 0.2% sulfur Residual Fuel Oil No. 6 for the Baseload Power Generating Plants.²
3. In accordance with proposed amendments to the Consent Decree between GPA and the United States Environmental Protection Agency ["USEPA"] (which have already been agreed to by USEPA), GPA will likely soon be required to use 0.2% Ultra Low Sulfur Fuel Oil ["ULSFO"] in the Cabras 1 & 2 plants, no later than December 31, 2022.³

¹ GPA Petition to Approve the Amendment to the Contract for Residual Fuel Oil No. 6 for the Baseload Power Generating Plants, GPA Docket 21-17, filed August 9, 2021.

² Id., at p. 1.

³ Guam Consolidated Commission on Utilities Resolution No. 2021-20, Relative to Approving the Proposed Amendment to the Consent Decree with the United States Environmental Protection Agency (USEPA), adopted and approved on July 27, 2021, at p. 3.

4. The “State Implementation Plan” (“SIP”), when finally approved, will require GPA to switch to a lower sulfur fuel to comply with certain new federal fuel standards by April 2023.⁴

BACKGROUND

5. On July 30, 2020, the PUC approved the GPA-Hyundai Contract for the supply of Residual Fuel Oil No. 6 to the Baseload Power Generating Plants.⁵ The Contract has a 3-year initial term, commencing September 1, 2020, and ending on August 31, 2023, with two additional 1-year extension options, upon the mutual agreement of the parties.⁶
6. In accordance with the Contract, Hyundai supplies a minimum annual supply to GPA of between one million and two million barrels of residual fuel oil per year.⁷
7. The Contract only provides for the delivery of two types of Fuel Grade: Low Sulfur Fuel Oil (LSFO), 1.19% w Sulfur (Maximum), and High Sulfur Fuel Oil (HSFO), 2.00% w Sulfur (Maximum).⁸
8. On April 20, 2020, the District Court of Guam approved a negotiated Consent Decree between the U.S. Environmental Protection Agency [“USEPA”] regarding

⁴ Issues for Decision, Resolution No. 2021-20, Proposed Amendment of Consent Decree between GPA and USEPA, CCU Commissioners’ Board Packet for the CCU Meeting on July 27, 2021; in a conversation between GPA Counsel and ALJ Horecky on August 17, 2021, Mr. Botha indicated that the draft State Implementation Plan for Guam includes the requirement that GPA switch to ULSFO by April 2023. The SIP is pending final administrative approval.

⁵ PUC Order, GPA Docket 20-17, dated July 30, 2020, at p. 4.

⁶ Id., at pgs. 2-3.

⁷ Contract for Supply of Residual Fuel Oil No. 6 between GPA and Hyundai Corporation, approved by the PUC on July 30, 2020, at Section 2, Fuel Oil to be Supplied.

⁸ Id., at Section 2.

alleged violations of the Clean Air Act. On December 5, 2019, the PUC approved the Consent Decree and authorized GPA to enter such Decree.⁹

9. The original Consent Decree required GPA to use only Low Sulfur Residual Fuel Oil (1.19% w Sulfur (Maximum)) as a fuel to power Cabras Units 1 & 2 upon the date that its existing fuel tanks were refurbished.¹⁰

10. The draft State Implementation Plan ("SIP"), when adopted, will require GPA to comply by April 2023 by switching to a lower sulfur fuel, in order to reach attainment with federal standards for sulfur dioxide emissions. GPA has agreed to transition to a fuel that is "cleaner" than the fuel required under the existing Consent Decree: "Specifically, GPA has agreed to transition to a fuel with sulfur content of no greater than 0.2% to power Cabras Units 1 & 2 until their retirement. This will substantially reduce emissions as compared to the low sulfur residual fuel oil ("RFO") allowed by the Consent Decree."¹¹

11. GPA indicates that it and the USEPA have agreed to the Modification of the Consent Decree which would allow GPA to transition to the Ultra-Low Sulfur Fuel Oil ("ULSFO") with a sulfur limit of 0.2% by weight, no later than December 31, 2022. To allow for provision by Hyundai Corporation of 0.2% sulfur ULSFO, an amendment of Contract between GPA and Hyundai is necessary. At present Hyundai Corporation can only provide to GPA LSFO with 1.19% sulfur or 2.00% HSFO.

⁹ PUC Order, GPA Docket 20-01, dated December 5, 2019, at p. 6.

¹⁰ Guam Consolidated Commission on Utilities Resolution No. 2021-20, Relative to Approving the Proposed Amendment to the Consent Decree with the United States Environmental Protection Agency (USEPA), approved and adopted on July 27, 2021, at p. 3.

¹¹ Issues for Decision, Resolution No. 2021-20, Proposed Amendment of Consent Decree between GPA and USEPA, CCU Commissioners' Board Packet for the CCU Meeting on July 27, 2021.

12. In Resolution No. 2021-19, the Guam Consolidated Commission on Utilities has approved an Amendment to the Hyundai Corporation Contract which would authorize the provision of ULSFO with a sulfur limit of 0.2%, effective January 1, 2022. GPA also determined that the Fixed Premium Fee proposal of Hyundai was “reasonable and provides the lowest cost for the Authority...”¹²

13. In addition, the Guam Consolidated Commission on Utilities also approved the Amendment of the Consent Decree that would require GPA to provide fuel with sulfur content of no greater than 0.2% to power Cabras Units 1 & 2 until their retirement, and no later than December 31, 2022.¹³ The amendment provides as follows: “Once the other, second tank has been emptied of high sulfur RFO, including all sludge from the high sulfur RFO, but in no event later than December 31, 2022, then continuing thereafter, GPA shall use a blended fuel with no greater than 0.2% sulfur by weight to power Cabras Units 1 & 2.”¹⁴

14. The Amendment to the Consent Decree will still need to be approved by the Department of Justice and the District Court of Guam.¹⁵

ANALYSIS

15. The Guam Consolidated Commission on Utilities contends that the Consent Decree between GPA and USEPA requires GPA to substitute the LSFO and HSFO and transition to Ultra Low Sulfur Fuel Oil (“ULSFO”) with a sulfur limit of 0.2% by

¹² CCU Resolution No. 2021-19, Authorizing Management of the Guam Power Authority to Amend the Contract for the Supply of Residual Fuel Oil No. 6, approved and adopted on July 27, 2021.

¹³ CCU Resolution No. 2021-20, Relative to Approving the Proposed Amendment to the Consent Decree with the United States Environmental Protection Agency (USEPA), adopted and approved on July 27, 2021.

¹⁴ Id., at p. 3.

¹⁵ Issues for Decision, Resolution No. 2021-20, Proposed Amendment of Consent Decree between GPA and USEPA, CCU Commissioners’ Board Packet for the CCU Meeting on July 27, 2021.

weight, no later than December 31, 2022.¹⁶ Technically, however, the Consent Decree has not yet been modified to require that the 0.2% ULSFO be used for the Cabras 1 & 2 plants.

16. GPA has represented that the USEPA has already agreed to various changes to the Consent Decree, subject to the required approvals. One such change is as follows: “In no event later than December 31, 2022, and continuing thereafter, GPA shall use a blended fuel with no grader than 0.2% sulfur by weight to power Cabras Units 1 & 2.”¹⁷ The CCU also approved such change in Resolution No. 2021-20.
17. In addition, GPA represents that the State Implementation Plan (“SIP”) will require GPA to switch to a lower sulfur fuel by April 2023 in order to reach attainment with federal standards for sulfur dioxide emissions. Based upon the inclusion of such requirement in the State Implementation Plan, and the agreement of GPA and USEPA to require the transition to a fuel with sulfur content of no greater than 0.2% to power Cabras Units 1 & 2, it is prudent for the PUC to approve the proposed amendment in the Hyundai Contract.
18. Since GPA is agreeing to use 0.2% ULSFO, which has a lower sulfur content than presently required in the Consent Decree, the Consent Decree would not appear to prevent GPA from using such ULSFO. However, GPA should continue to diligently pursue the securing of all necessary approvals for the Consent Decree amendments, including approval by the Department of Justice and the District Court of Guam.

¹⁶ CCU Resolution No. 2021-19, Authorizing Management of the Guam Power Authority to Amend the Contract for the Supply of Residual Fuel Oil No. 6, approved and adopted on July 27, 2021.

¹⁷ Negotiated Consent Decree Changes, July 2021 (included in CCU Commissioners’ Board Packet for the CCU Meeting on July 27, 2021, at p. 2.).

19. The amendment includes the provision by Hyundai Corporation of a new type of fuel that was not provided for in the original contract. An issue could arise concerning the propriety of including a new type of fuel in the contract without issuing a separate bid for such fuel supply. However, the ALJ believes that GPA has properly addressed this concern.

20. To begin with, the type of fuel which could be delivered under the contract refers to “RESIDUAL FUEL OIL NO. 6” in Schedule A of the Contract. The new fuel oil (ULSFO) which Hyundai Corporation would supply to GPA is still Residual Fuel Oil, which arguably falls within the Contract specifications. In addition, Hyundai also already supplies LSFRO to GPA under the Contract, albeit with higher sulfur content (1.19%). The 0.2% fuel will be produced as a “blended fuel.” The type of fuel provided would not appear to be so different as to require a new procurement.

21. Section 14, Government Laws and Regulations, of the Hyundai Corporation Contract expressly contemplates that Hyundai will use its best efforts to furnish GPA’s substitute fuel oil which complies with government laws and regulations:

“If any time during the term of the Contract the Government of the United States or the Territory of Guam enacts laws or issues regulations which would prevent **GPA** from burning the type of fuel oil to be supplied hereunder, **GPA** shall use its best efforts to obtain an exemption. In the event **GPA** cannot obtain an exemption from such laws and regulations, **CONTRACTOR** shall use his best efforts to furnish **GPA** substitute fuel oil which complies with such governmental laws and regulations at the same price set out herein, or if unreasonable, at a price to be renegotiated by the parties....”¹⁸

¹⁸ Contract for Supply of Residual Fuel Oil No. 6 between GPA and Hyundai Corporation, approved by the PUC on July 30, 2020, at Section 14, Government Laws and Regulations.

22. The requirement that Hyundai Corporation supply 0.2% LSRFO is fully appropriate pursuant to Section 14.

23. The 0.2% ULSFO that GPA will utilize after December 31, 2022, is more expensive than the HSRFO and LSRFO presently utilized. For the year commencing on January 1, 2023, it is estimated that the annual value of the contract amendment with Hyundai will be \$160,445,436 per year.¹⁹ The present estimated cost under the Hyundai Corporation Contract for fuel from September 1, 2021, to August 31, 2022, is \$143,915,313.77.²⁰

24. The estimated price of the 0.20% sulfur ULSFO is \$601.290/MT (Metric Ton), whereas the July 2021 prices for 1.19% LSFO and HSFO were respectively \$428.81/MT (Metric Ton). The differential cost per metric ton was estimated to be 23% greater for 0.2%ULSFO than 1.19% LSRFO.²¹

25. Recognizing the higher cost of 0.2% ULSFO, the CCU confirmed GPA's determination that the Fixed Premium Fee for the 0.2% ULSFO (\$79.00/MT and \$18,632,075.47/yr.) were reasonable.

26. A copy of the proposed Amendment No. 1 to the Hyundai Contract is attached hereto as Exhibit "1". The Consent Decree and the State Implementation Plan will not require GPA to use 0.2% ULSFO until December 31, 2022; however, pursuant to Amendment No. 1, GPA seeks to receive 0.2% ULSFO beginning in the February/March 2022 time frame.

¹⁹ CCU Resolution No. 2021-19, Authorizing Management of the Guam Power Authority to Amend the Contract for the Supply of Residual Fuel Oil No. 6, approved and adopted on July 27, 2021, at p. 2; and see also Exhibit A to CCU Resolution No. 2021-19.

²⁰ Email from GPA Legal Counsel Graham Botha to PUC Administrative Law Judge Fred Horecky, with attached RFO Expenses Sept 2020 to Aug 2021 (by Albert Florencio, GPA Fuel Manager) dated August 16, 2021.

²¹ CCU Resolution No. 2021-19, Authorizing Management of the Guam Power Authority to Amend the Contract for the Supply of Residual Fuel Oil No. 6, approved and adopted on July 27, 2021, Exhibit A (HYUNDAI PROPOSAL FOR ULSFO (0.20% sulfur)) and HYUNDAI CONTRACT FIXED PREMIUM FEE & ESTIMATED UNIT COST COMPARISON.

27. The justification for use of such fuel oil by GPA before the Consent Decree requires it is as follows: "...GPA will be ordering .2% for Tank 1935 when it is finished in Feb/Mar 2022 time frame and phasing out the 1.19% LSRFO. Tank 1934 will be emptied out and when finished (1 year) will be filled with ULSD. We do not want to temporarily put 1.19% in Tank 1935 and then have to pay \$1M+ to clean out sludge before Dec 2022, so we will go directly to .2% RFO."²² GPA's justifications for the earlier usage of ULSFO are avoidance of costs to again clean out Tank 1935 if a higher sulfur fuel were stored in such tank even temporarily, and to avoid loss of use of Tank 1935 during the period when it would need to be cleaned for a second time.

28. Since GPA will be required to convert its fuel source for the baseload plants to 0.2% ULSFO, the cost of such fuel is likely an unavoidable expense for GPA. Such ULSFO is essential to the operation of the Cabras power plants, and a contract amendment is reasonable, prudent, and necessary.²³

RECOMMENDATION


29. The Administrative Law Judge recommends that the PUC approve the amendment of the Contract between GPA and Hyundai Corporation for supply of 0.2% sulfur Residual Fuel Oil No. 6 to the Baseload Power Plants and authorize GPA to proceed with the execution of such contract amendment.

²² Email from GPA Counsel Graham Botha to PUC ALJ Fred Horecky dated August 17, 2021, with explanation of discussion between Mr. Botha and Albert N. Florencio, Fuel Manager.

²³ GPA Petition to Approve the Amendment to the Contract for Residual Fuel Oil No. 6 for the Baseload Power Generating Plants, GPA Docket 21-17, filed August 9, 2021, at p. 2.

30. A Proposed Order is submitted herewith for the consideration of the
Commissioners.

Dated this 23rd day of August 2021.


Frederick J. Horecky
Chief Administrative Law Judge

AMENDMENT NO. I
TO THE FUEL OIL SUPPLY CONTRACT
BETWEEN
THE GUAM POWER AUTHORITY
AND
HYUNDAI CORPORATION

EFFECTIVE DATE

THIS AMENDMENT NO. I, to the Fuel Oil Supply Contract under reference IFB GPA-050-20, hereinafter referred to as the "CONTRACT," between the **GUAM POWER AUTHORITY**, hereinafter referred to as "**GPA**" and **HYUNDAI CORPORATION**, hereinafter referred to as "**CONTRACTOR**", shall become effective on or about January 01, 2022.

RECITALS

WHEREAS, **GPA** and **CONTRACTOR** entered into a 3-year contract for the Supply of Residual Fuel Oil No.6, reference GPA-050-20, effective September 1, 2020; and

WHEREAS, the fuel grades to be supplied under the contract consist of the Low Sulfur Fuel Oil ("LSFO") with a sulfur limit of 1.19% by weight and High Sulfur Fuel Oil ("HSFO") with a sulfur content limit of 2.00% by weight, respectively; and

WHEREAS, USEPA requires GPA to substitute the LSFO and HSFO and transition to Ultra-Low Sulfur Fuel Oil ("ULSFO") with a sulfur limit of 0.20% by weight; and

WHEREAS, pursuant to Section 14 (Government Laws and Regulations) of the contract, GPA and the **CONTRACTOR** have negotiated for the substitute fuel and **CONTRACTOR** agreed to provide the Ultra-Low Sulfur Fuel Oil ("ULSFO"); and

WHEREAS, the parties desire to amend the CONTRACT with changes to certain provisions thereof; and

WHEREAS, Section 40 (Amendment and Waiver) of the CONTRACT authorizes amendment to the CONTRACT by an instrument in writing signed by the party against whom enforcement of the change, waiver, alteration, amendment, discharge, or termination is sought.

NOW THEREFORE, for and in consideration of the mutual covenants contained in the CONTRACT and herein, the parties hereto do hereby agree as follows:

SECTION 2: FUEL OIL TO BE SUPPLIED

Delete in its entirety and Replace with:

"SECTION 2: FUEL OIL TO BE SUPPLIED

CONTRACTOR agrees to furnish and **GPA** agrees to accept and pay for all of **GPA's** fuel oil requirements for power generating plants in Guam for the term of the Contract. Fuel Oil to be supplied to **GPA** shall conform to the product quality requirements specified in Schedule A and shall come from reputable sources not sanctioned by the United States government.

The first delivery of fuel oil pursuant to the Contract is anticipated to be on or about **September 01, 2020**.

Estimated combined quantities:

Estimated Annual Requirement (Barrels per Year)			
Fuel Grade	First (1 st) Year	Second (2 nd) Year	Third (3 rd) Year
High Sulfur Fuel Oil (HSFO), 2.00% _w Sulfur (Maximum)	1,500,000	500,000	0
Low Sulfur Fuel Oil (LSFO), 1.19% _w Sulfur (Maximum)	500,000	0	0

Ultra-Low Sulfur Fuel Oil (ULSFO), 0.20% _w Sulfur (Maximum)	0	500,000- 1,000,000	1,000,000
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This information is provided as reference material only. Although every attempt has been made to ensure its accuracy, **GPA** makes no guarantees that these quantities will be achieved but they may be exceeded. **GPA** expressly disclaims any liability whatsoever arising from reliance or non-reliance of the data provided.”

SECTION 4. CONTRACT PRICE

Delete in its entirety and Replace with:

“SECTION 4. CONTRACT PRICE

The total contract price in U.S. Dollars per Metric Ton (\$/MT) for all residual fuel oil delivered D.E.S. Guam (discharge port) to **GPA** shall be inclusive of all costs and liabilities incurred prior to delivery at discharge port, Cabras Island, Guam.

DES (Delivered Ex- Ship) PROVISIONS:

Under this term, the **CONTRACTOR** quotes a price including the cost of the goods, the marine insurance, and all transportation charges to the designated point of destination (**GPA**). Under this quotation, the **CONTRACTOR** must:

- (1) provide and pay for transportation to named point of destination (**GPA**);
- (2) pay applicable taxes or charges levied on the cargo prior to passage of title to GPA;
- (3) provide and pay for marine insurance;
- (4) provide war risk insurance;
- (5) obtain and dispatch promptly to **GPA**, or its agent, copies from the original document of a clean bill of lading, and also insurance policy or negotiable insurance certificate;
- (6) provide **GPA** with copies from the original document of certificates of origin, or any documents issued in the country of origin, or of shipment, or both, which **GPA** may require for importation of goods and, where necessary, for their passage in transit into another country.
- (7) where received-for-shipment ocean bill of lading may be tendered, be responsible for

any loss or damage, or both, until the goods have been delivered into the custody of the ocean carrier to **GPA**;

(8) where on-board ocean bill of lading is required, be responsible for any loss or damage, or both, until the goods have been delivered on board the vessel to **GPA**;

The **CONTRACT PRICE** shall be the **BID PRICE OFFER** calculated as the **BID REFERENCE PRICE** plus the Contractor's **FIXED PREMIUM FEE** in U.S. dollars per Metric Ton (\$/MT) for all residual fuel oil delivered to **GPA** at the Port of Guam.

The BID PRICE is the sum of the FIXED SERVICE FEE (per Metric Ton) and the BID REFERENCE PRICE as of December 2, 2019 as posted in the Platts' Asia-Pacific Marketscan Oil Prices.

BID REFERENCE PRICE:

A. HSFO (2.00%w sulfur) and LSFO (1.19%w sulfur):

The BID REFERENCE PRICE shall be based on the Platt's Singapore Products Assessment for Fuel Oil Cargoes "HSFO 180 CST" for December 2, 2019.

Reference date: December 2, 2019

	<u>Low (\$/MT)</u>	<u>High (\$/MT)</u>
HSFO 180 CST	\$ 214.62	\$ 214.66

The following is a sample calculation of the mean price for "HSFO 180 cst" published in the **Platt's Marketscan, Singapore Products Assessments** for Fuel Oil Cargoes for December 2, 2019.

Mean Singapore Spot = Low + High Price Assessments:

$$= \frac{\$ 214.62 + \$ 214.66}{2} \text{ per Metric Ton (MT)}$$

$$= \$ 214.640 \text{ per Metric Ton (MT)}$$

BID REFERENCE PRICE = \$ 214.640 per Metric Ton

B. ULSFO (0.20%w sulfur):

The BID REFERENCE PRICE shall be based on the Platt's Singapore Products Assessment for Fuel Oil Cargoes "Gasoil 10ppm" for December 2, 2019. Conversion factor shall be 7.45 bbl/MT.

Reference date: December 2, 2019

	<u>Low (\$/bbl)</u>	<u>High (\$/bbl)</u>
Gasoil 10 ppm	\$ 75.14	\$ 75.18

The following is a sample calculation of the mean price for "Gasoil 10ppm" published in the **Platt's Marketscan, Singapore Products Assessments** for Fuel Oil Cargoes for December 2, 2019.

Mean Singapore Spot = Low + High Price Assessments:

$$= \frac{\$ 75.14 + \$ 75.18}{2} \text{ per Metric Ton (MT)}$$

$$= \$75.16 \text{ per barrel}$$

BID REFERENCE PRICE = \$75.16 per barrel x 7.45 bbl/MT

$$= \text{\$559.942 per Metric Ton}$$

BID PRICE OFFERS (D.E.S. Ex-Ship Guam):

HSFO 2.00% _w Sulfur Max	THREE (3)-YEAR CONTRACT BASE PERIOD US\$/MT (3 decimals)			TWO (2) -YEAR CONTRACT EXTENSION OPTION US\$/MT (3 decimals)	
	First (1 st) Year Base Period	Second (2 nd) Year Base Period	Third (3 rd) Year Base Period	First (1 st) Year Extension	Second (2 nd) Year Extension
A. Bid Reference Price	\$214.64	\$214.64	\$214.64	\$214.64	\$214.64
<u>B. Fixed Premium Fee</u>	<u>\$ 71.690</u>	<u>\$ 71.690</u>	<u>\$ 71.690</u>	<u>\$ 71.690</u>	<u>\$ 71.690</u>
BID PRICE (A+B)	\$286.330	\$286.330	\$286.330	\$286.330	\$286.330

LSFO 1.19% _w Sulfur Max	THREE (3)-YEAR CONTRACT BASE PERIOD US\$/MT (3 decimals)			TWO (2) -YEAR CONTRACT EXTENSION OPTION US\$/MT (3 decimals)	
	First (1 st) Year Base Period	Second (2 nd) Year Base Period	Third (3 rd) Year Base Period	First (1 st) Year Extension	Second (2 nd) Year Extension
A. Bid Reference Price	\$214.640	\$214.64	\$214.64	\$214.64	\$214.64
B. <u>Fixed Premium Fee</u>	<u>\$124.690</u>	<u>\$124.690</u>	<u>\$124.690</u>	<u>\$124.690</u>	<u>\$124.690</u>
BID PRICE (A+B)	\$339.330	\$339.330	\$339.330	\$339.330	\$339.330

ULSFO 0.20% _w Sulfur Max	THREE (3)-YEAR CONTRACT BASE PERIOD US\$/MT (3 decimals)			TWO (2) -YEAR CONTRACT EXTENSION OPTION US\$/MT (3 decimals)	
	First (1 st) Year Base Period	Second (2 nd) Year Base Period	Third (3 rd) Year Base Period	First (1 st) Year Extension	Second (2 nd) Year Extension
A. Bid Reference Price	\$559.942	\$559.942	\$559.942		
B. <u>Fixed Premium Fee</u>	<u>\$ 79.000</u>	<u>\$ 79.000</u>	<u>\$ 79.000</u>	<u>Negotiable</u>	<u>Negotiable</u>
BID PRICE (A+B)	\$638.942	\$638.942	\$638.942		

”

SCHEDULE A: PRODUCT QUALITY SPECIFICATION

Delete in its entirety and Replace with:

“SCHEDULE A: PRODUCT QUALITY SPECIFICATION

Item	Test Parameter	Unit of Measure	Approved Test Method	Acceptable Alternate Test Methods	Minimum Allowed Value	Maximum Allowed Value	Comments
1	Sulphur Content	% mass	ASTM D-4294	ASTM D-2622	N/A	HSFO = 2.00 LSFO = 1.19 ULSFO = 0.20	
2	Sulphur Mercaptan	Ppm (g/kg)	ASTM D-3227	UOP 163		100	
3	Pour Point	Deg C	ASTM D-97	N/A	N/A	21	
4	Flash Point	Deg C	ASTM D-93	N/A	66	N/A	
5	Kinematic Viscosity	cSt at 50 °C	ASTM D-445	ASTM D-2161		175	
6	Sediment By Extraction	% mass	ASTM D-473	N/A	N/A	0.10	
7	Water						

	By Distillation	% by Volume	ASTM D-95	N/A	N/A	0.50	
8	Vanadium Content	Parts Per Million	ASTM D-5708	a)ASTM D-5184 b)ASTM D-5863 c) IP 501 d) IP 433 e) ISO 14597	N/A	90	
9a	Silicon Content	Parts Per Million	ASTM D-5184	a) IP 470 b) IP 377 c) ISO 10487 d) IP 501	N/A	Combined Al + Si Not to exceed 70 ppm. Al not to exceed 30 ppm.	Individual results to be reported separately
9b	Aluminum Content	Parts Per Million	ASTM D-5184	a) IP 470 b) IP 377 c) ISO 10487 d) IP 501	N/A		
10	Guaranteed Gross Heating Value (HHV)	Million BTU Per US Barrel	ASTM D-240	N/A	6.10	N/A	
11	Micro- Carbon Residue	% mass	ASTM D-4530	ASTM D-5245 ASTM D-189	N/A	13	
12	Ash	% mass	ASTM D-482	N/A	N/A	0.10	
13	Asphaltenes	% mass	ASTM D-6560	IP 143	N/A	5	
14	Sodium	Ppm	ASTM D-5863/B	ASTM D-5708/B IP288 IP 501	N/A	40	
15a	Total Sediment (Existent)	% mass	ISO 10307-2	ASTM D-4870 IP 377	N/A	0.10	
15b	Total Sediment (Potential)	% mass	ISO 10307-2	ASTM D-4870 IP 377	N/A	0.10	
15c	Total Sediment (Accelerated)	% mass	ISO 10307-2	ASTM D-4870 IP 377	N/A	0.10	
16	Compatibility	a) Cleanliness ratio b) Compatibility ratio	ASTM D-4740	N/A	N/A	a) 1 b) 1	a) to be reported from load port b) to be determined on arrival Guam unless otherwise notified in the specific instance. See Note.
17	API Gravity		ASTM D-287	ASTM D-1298 and conversion	12.1	23.0	
18	Density @ 15 °C	Kg/L	ASTM D-287	ASTM D-1298 ASTM D-4052		0.9870	
19	Odor				Report		See Note
20	Hydrogen Sulfide content (in liquid phase)	Mg/kg	IP-399	IP-570	N/A	2.0	See Note
21	Used lubricating Oil (ULO)				The fuel shall be free of ULO		See note
	Zinc	Mg/kg	IP 501	IP 470		10	
	Phosphorus	Mg/kg	IP 501	IP 500		10	
	Calcium	Mg/kg	IP 501	IP 470		30	

The Authority reserves the right to require the supplier to add and to conduct additional tests as necessary.

Notes on Schedule A:

Item 16: Compatibility

CONTRACTOR shall ensure that each shipment of fuel oil is compatible with a representative sample of the previous shipment of the same grade. Testing for compatibility will be conducted at load port according to the test method ASTM D-4740 mutually agreed between both parties and the **CONTRACTOR** will guarantee spot rating of 1.

Item 19: Odour.

The odor shall be typical and characteristic of mild hydrocarbon smell, but must not be unusually strong, repulsive, or obnoxious. The fuel delivered shall be subject to inspection by regulatory agencies such as the United States Environmental Protection Agency (USEPA), or by an independent third party inspector, should issues related to odour arise. In the event that such unusually strong, repulsive, or obnoxious odor is detected and is deemed due to the quality of the product delivered by the Contractor, the product shall be replaced at the Contractor's expenses.

Item 20:

Hydrogen Sulfide in Liquid Phase. Individual samples shall be drawn on the ship compartments. Report shall be based on the mathematical average of the test results.

Hydrogen Sulfide in Vapour. The Contractor or its agent is required to disclose the Hydrogen Sulfide concentration for each cargo compartment on a daily basis upon sailing from the load port. The Contractor shall ensure that the Hydrogen Sulfide concentration in vapour phase on board the vessel does not exceed 80 ppm prior to cargo arrival on Guam.

In the event that the Hydrogen Sulfide levels are exceeded on cargo arrival, the vessel will be required to leave the Guam port and de-gas to the required concentration and all costs shall be borne by the Contractor.

Item 21: Used Lubricating Oil.

A fuel shall be considered to be free of ULO if one or more of the elements zinc, phosphorus and calcium are below or at the specified limits.

All three elements shall exceed the same limits before a fuel shall be deemed to contain ULO.”

All other terms and condition of the Contract as amended shall remain unchanged.

SO AGREED this _____ day of _____ 2021 by:

For the Guam Power Authority:

For Hyundai Corporation:

JOHN M. BENAVENTE, P.E.
General Manager

MONG HYUCK CHUNG
Chairman & C.E.O.

APPROVED AS TO LEGAL FORM AND SUFFICIENCY:

D. GRAHAM BOTHA
GPA LEGAL COUNSEL