INSIDE TERMINAL
Circuit 3
- Transfer line -

PHOTO NO. : 1

LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 11, 12 & 13
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Diesel pump house and tank 1934 farm area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
General view of 12'' RFO no. 6 transfer line from diesel Pump discharge line to tank 1934.	Nil.

Prepared By : *MOHD. KHAIRI*

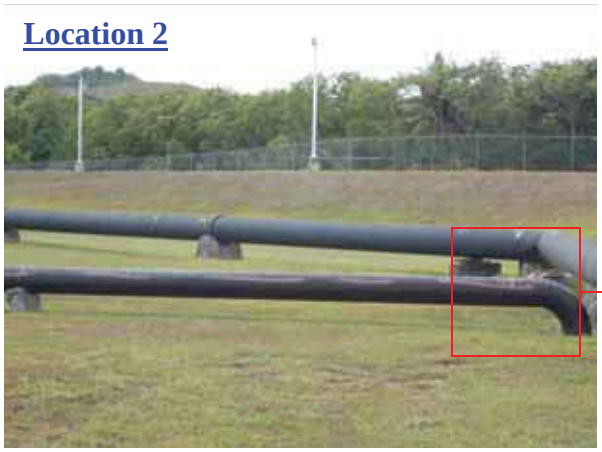
LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 11
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Diesel Pump House Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Scattered general corrosion with scaling was noted at bottom section of piping, marked as location 1 in ISO drawing. 2. Remnant tack weld was noted at side section of piping. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	1. Consideration to perform permanent repair at this area with remove the corrosion, restore with weld metal deposited/insert weld patch, follow by NDE and re-painting as per client's specification. 2. To grind flush and follows by maintenance painting as per client's specification.

Prepared By : *MOHD. KHAIRI*

PHOTO NO. : 3

LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 11
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Diesel Pump House Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Paint failure with surface rust was noted at some section of V-142 and minor crevice corrosion between flanges. 2. Wrapping tape at buried piping was observed deteriorated, however no sign of corrosion was noted at soil to air interface area.	1. To perform surface preparation and follows by maintenance painting as per client's specification. 2. To replace the wrapping with suitable material for buried piping and ensure water would not ingress inside and promote to corrosion.

Prepared By : *MOHD. KHAIRI*



LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 11
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Corrosion under wrapping was noted at soil to air interface area due to wrap failure and gives a path to water ingress inside, marked as location 2 in ISO drawing. No sign of corrosion propagate deeper after the wrapping end. **Please refer Appendix 2 for ½ remaining life calculation at pits area.* .	Consideration to perform permanent repair at this area with remove the corrosion, restore with weld metal deposited/insert weld patch, apply coal tar enamel and re-wrap with proper procedure and suitable wrapping for buried piping up to 6'' from soil to air interface.

Prepared By : *MOHD. KHAIRI*

Before support 1 	Between support 1 & 2 
Between V-143 & support 8 	Between support 10 & 11 

LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 11 & 12
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Remnant tack weld was noted on top and side section of piping.	To grind flush and follows by maintenance painting as per client's specification.

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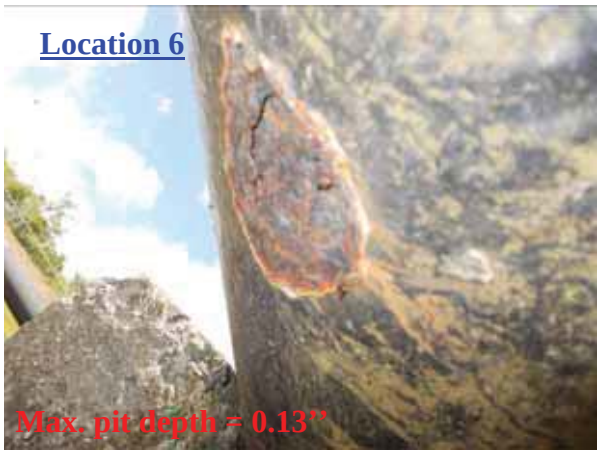
VISUAL INSPECTION FINDINGS AND RECOMMENDATIONS
WITH PHOTOGRAPHS
VITAL ENERGY, GUAM, U.S.A

PHOTO NO. : 6



LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 12
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Localized corrosion with scaling/pits was noted at bottom section of piping, marked as locations 3, 4, and 6 in ISO drawing. 2. Corrosion with scaling was noted at contact area between piping and support, marked as location 5 in ISO drawing. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	1. To perform surface preparation and follows by maintenance painting as per client's specification. 2. To lift the piping and consideration to perform permanent repair at this area with remove the corrosion, restore with weld metal deposited/insert weld patch, follow by NDE and re-painting as per client's specification. Note:-Pits depth measurement at contact area between piping and support based on estimation due to inaccessible area.

Prepared By : *MOHD. KHAIRI*

VISUAL INSPECTION FINDINGS AND RECOMMENDATIONS
WITH PHOTOGRAPHS
VITAL ENERGY, GUAM, U.S.A

PHOTO NO. : 7

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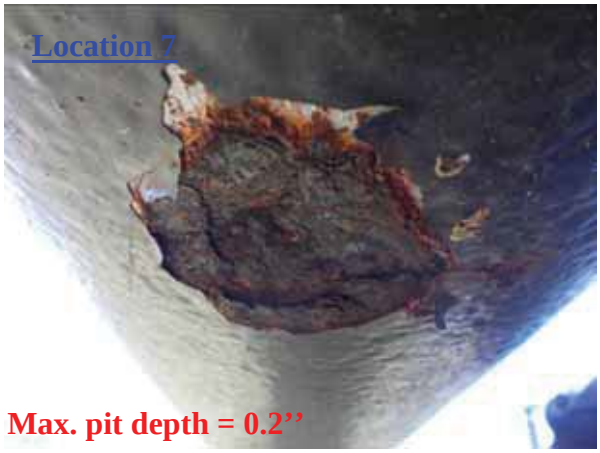
<td> 
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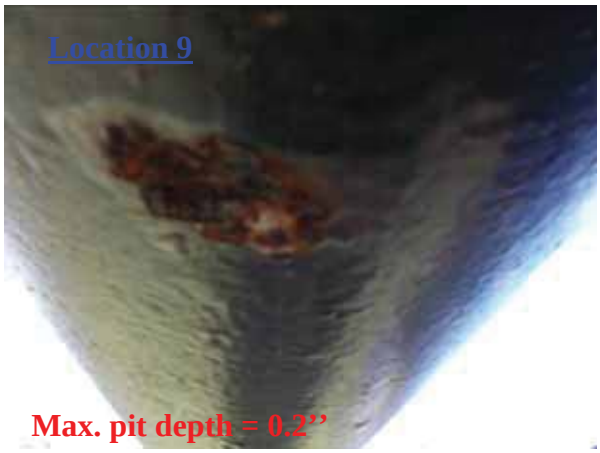
<td> 
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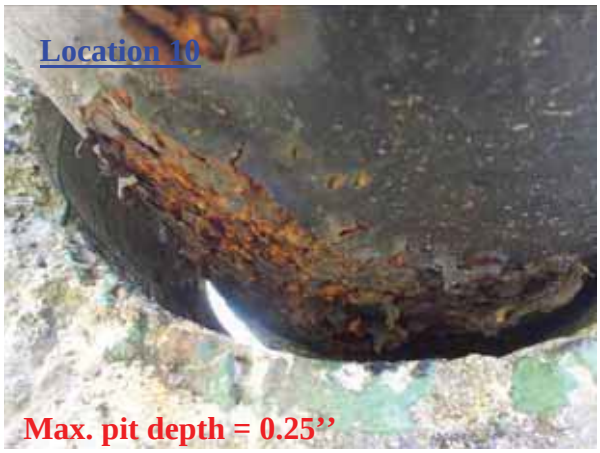
<td> 
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<tr><td>12'' Residual Fuel Oil No. 6 (RFO no. 6)</td><td>ISO drawing no. 12</td></tr>
<tr><td>DESCRIPTION</td><td>LOCATION</td></tr>
<tr><td>Circuit 3 - Transfer line</td><td>Inside Terminal – Tank 1934 Farm Area
*Please refer Appendix 3 for detail location</td></tr>
<tr><td>FINDING</td><td>RECOMMENDATIONS</td></tr>
<tr><td>1. Localized corrosion with scaling/pits was noted at bottom section of piping, marked as locations 7, 8, and 9 in ISO drawing.
2. Gap was observed between piping and support and localized corrosion with scaling/pits was noted at the area, marked as location 10 in ISO drawing.
*Please refer Appendix 2 for ½ remaining life calculation at pits area.</td><td>1. To perform surface preparation and follows by maintenance painting as per client's specification for location 9. Consideration to perform permanent repair at locations 7, 8 with remove the corrosion, restore with weld metal deposited/insert weld patch, follow by NDE and re-painting as per client's specification.
2. To lift the piping and consideration to perform permanent repair as above.
Note:-Pits depth measurement at contact area between piping and support based on estimation due to inaccessible area.</td></tr>
</table>

Prepared By : *MOHD. KHAIRI*

LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 12
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Localized corrosion with scaling/pits was noted at bottom section of piping, marked as locations 12, and 13 in ISO drawing. 2. Corrosion with scaling was noted at contact area between piping and support, marked as locations 11 and 14 in ISO drawing. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	1. To perform surface preparation and follows by maintenance painting as per client's specification for location 13. Consideration to perform permanent repair at locations 12 with remove the corrosion, restore with weld metal deposited/insert weld patch, follow by NDE and re-painting as per client's specification. 2. To lift the piping, perform surface preparation and follows by maintenance painting as per client's specification for location 11 and permanent repair as above for location 14. Note:-Pits depth measurement at contact area between piping and support based on estimation due to inaccessible area.

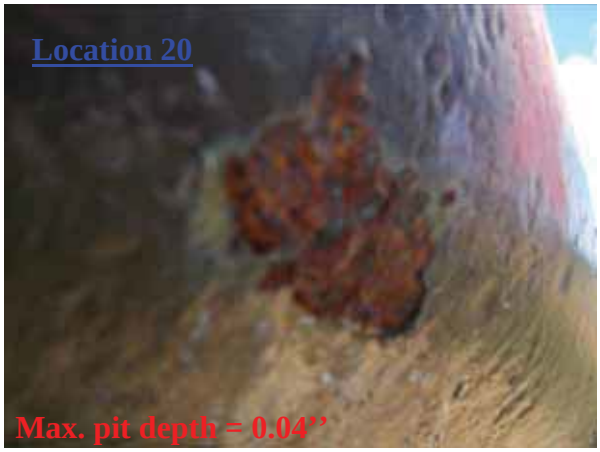
Prepared By : *MOHD. KHAIRI*

LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 12
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Localized corrosion with scaling/pits was noted at bottom section of piping, marked as locations 15, and 16 in ISO drawing. 2. Corrosion with scaling was noted at contact area between piping and support, marked as location 17 in ISO drawing. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	1. To perform surface preparation and follows by maintenance painting as per client's specification for location 15. Consideration to perform permanent repair at locations 16 with remove the corrosion, restore with weld metal deposited/insert weld patch, follow by NDE and re-painting as per client's specification. 2. To lift the piping and perform surface preparation and follows by maintenance painting as per client's specification. Note:-Pits depth measurement at contact area between piping and support based on estimation due to inaccessible area.

Prepared By : *MOHD. KHAIRI*

LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 12
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Corrosion under wrapping was noted at soil to air interface area due to wrap failure and gives a path to water ingress inside, marked as location 18 and 19 in ISO drawing. No sign of corrosion propagate deeper after the wrapping end. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	To perform surface preparation extend to the last corrosion, apply coal tar enamel and re-wrap with proper procedure and suitable wrapping for buried piping up to 6'' from soil to air interface.

Prepared By : *MOHD. KHAIRI*



LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 12
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Localized corrosion with/pits was noted at bottom section of piping, marked as locations 20, 21, 22 and 23 in ISO drawing. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	To perform surface preparation and follows by maintenance painting as per client's specification.

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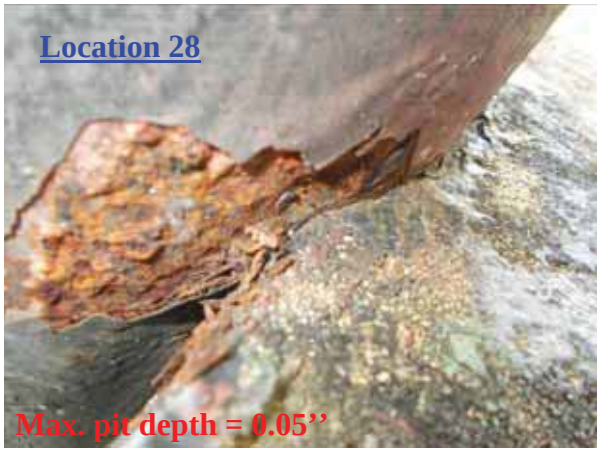
LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 12 & 13
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Localized corrosion with/pits was noted at bottom section of piping, marked as locations 24, 25, 26 and 27 in ISO drawing. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	To perform surface preparation and follows by maintenance painting as per client's specification.

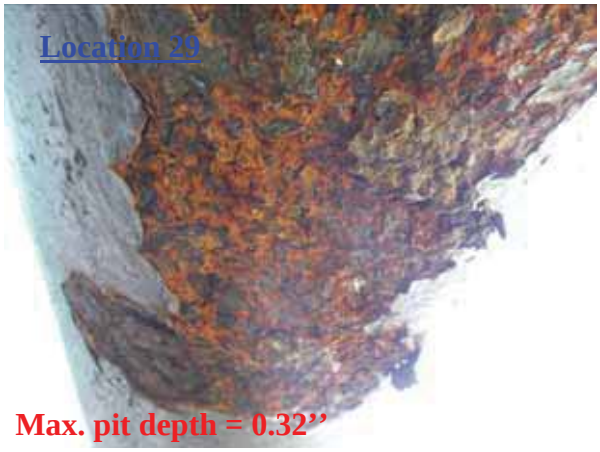
Prepared By : *MOHD. KHAIRI*

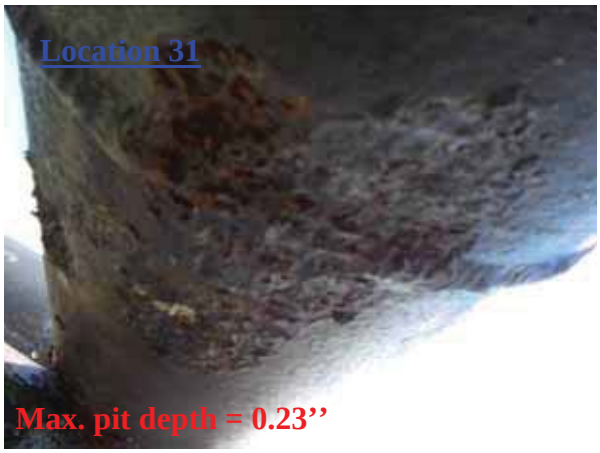
PHOTO NO. : 13

LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 13
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Stud bolts of flange was noted not extend out through their nut. 2. Paint failure with surface was noted at some section of V-143 valve.	1. To replace with longer stud bolt with the same material and specification. 2. To perform surface preparation and follows by maintenance painting as per client's specification.

Prepared By : *MOHD. KHAIRI*

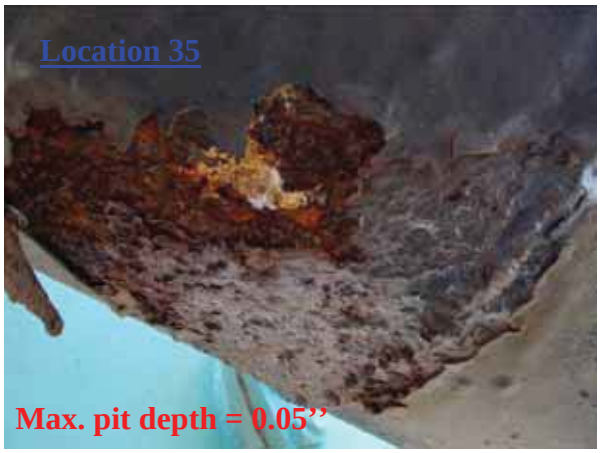






LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 13
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Localized corrosion with scaling/pits was noted at bottom section of piping, marked as locations 29, and 31 in ISO drawing. 2. Corrosion with scaling was noted at contact area between piping and support, marked as locations 28 and 30 in ISO drawing. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	1. Consideration to perform permanent repair at this area with remove the corrosion, restore with weld metal deposited/insert weld patch, follow by NDE and re-painting as per client's specification. 2. To lift the piping and perform surface preparation and follows by maintenance painting as per client's specification for location 28 and permanent repair as above for location 30. Note:-Pits depth measurement at contact area between piping and support based on estimation due to inaccessible area.

Prepared By : *MOHD. KHAIRI*



LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 13
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Localized corrosion with scaling/pits was noted at bottom section of piping, marked as locations 32, 33, 34 and 35 in ISO drawing. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	Consideration to perform permanent repair at location 32 with remove the corrosion, restore with weld metal deposited/insert weld patch, follow by NDE and re-painting as per client's specification and the rest to apply maintenance painting.

Prepared By : *MOHD. KHAIRI*

INSIDE TERMINAL
Circuit 3
- Fuel supply line -

PHOTO NO. : 1

LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6	ISO drawing no. 14 to 18
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1934, 1935 farm and pump area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
General view of fuel supply line from tank 1934 & 1935 to pump.	Nil.

Prepared By : *MOHD. KHAIRI*

VISUAL INSPECTION FINDINGS AND RECOMMENDATIONS
WITH PHOTOGRAPHS
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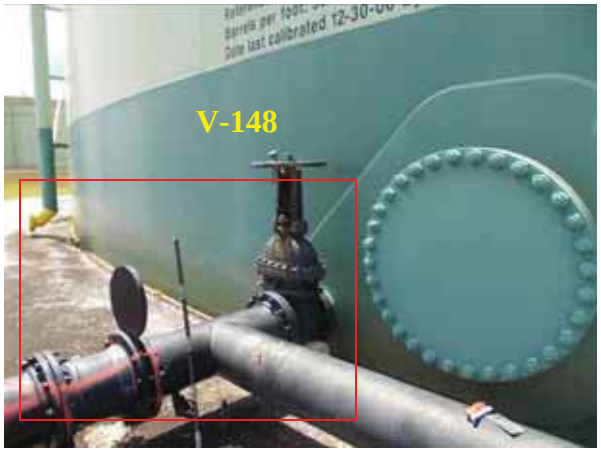
PHOTO NO. : 2



LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 14
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. General view of small bore piping (¾'' drain line). 2. Stud bolts of flange was noted not extend out through their nut. 3. Stud bolts of flanges was noted to be missing.	1. Consideration to perform profile Radiographic Testing (RT) for thickness measurement at small bore piping. 2. To replace with longer stud bolt with the same material and specification. 3. To replace the missing stud bolt with the same material and specification

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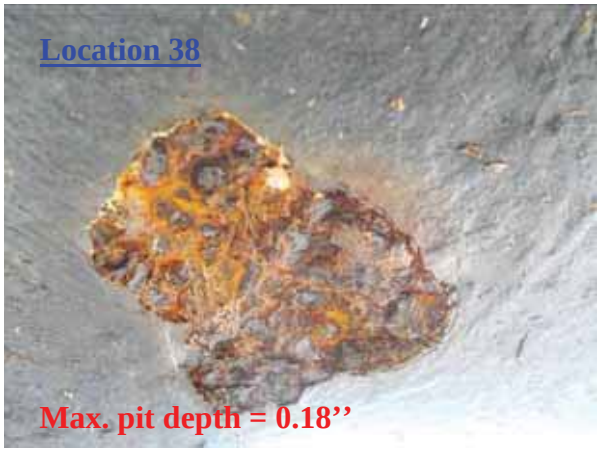
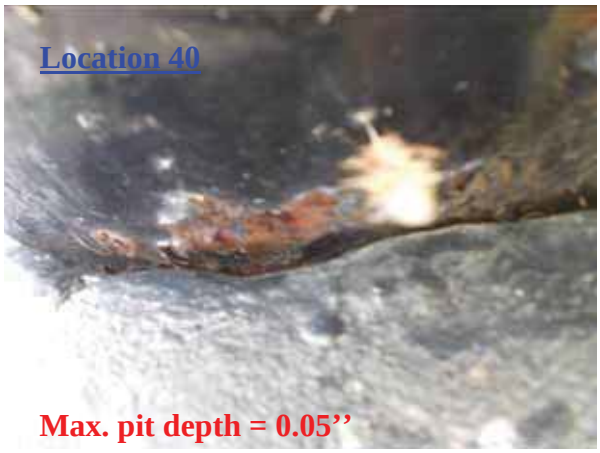
LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6 (RFO no. 6)	ISO drawing no. 14
DESCRIPTION	**LOCATION**
Circuit 3 - Transfer line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Corrosion with scaling was noted at contact area between piping and support, marked as locations 36 and 37 in ISO drawing. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	To lift the piping and perform surface preparation and follows by maintenance painting as per client's specification for location 37 and consideration to perform permanent repair at location 36 with remove the corrosion, restore with weld metal deposited/insert weld patch, follow by NDE and re-painting as per client's specification. Note:-Pits depth measurement at contact area between piping and support based on estimation due to inaccessible area.

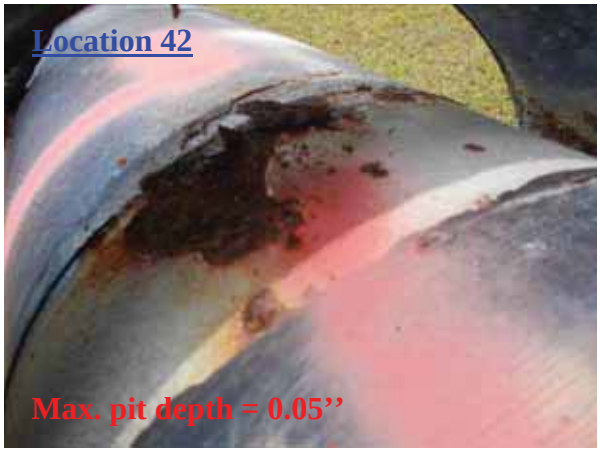
Prepared By : *MOHD. KHAIRI*

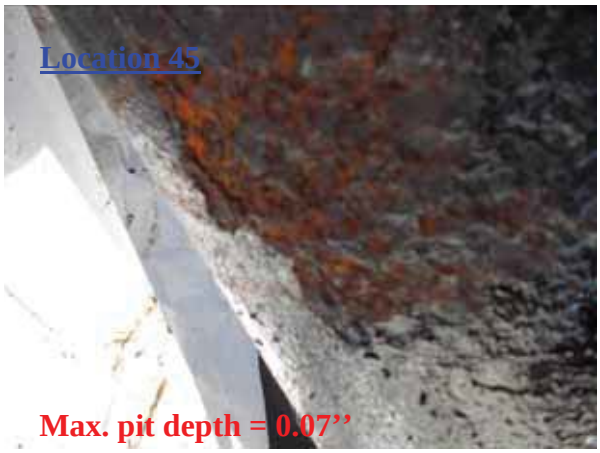




LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6	ISO drawing no. 14
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Localized corrosion/pits was noted at bottom section of piping, marked as locations 38, and 39 in ISO drawing. 2. Corrosion was noted at contact area between piping and support, marked as locations 40 and 41 in ISO drawing. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	1. To perform surface preparation and follows by maintenance painting as per client's specification for location 38. Consideration to perform permanent repair at location 39 with remove the corrosion, restore with weld metal deposited/insert weld patch, follow by NDE and re-painting as per client's specification. 2. To lift the piping, perform surface preparation and follows by maintenance painting as per client's specification for location 40 and permanent repair as above for location 41. Note:-Pits depth measurement at contact area between piping and support based on estimation due to inaccessible area.

Prepared By : *MOHD. KHAIRI*





LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6	ISO drawing no. 14
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Localized corrosion/pits was noted at bottom section of piping, marked as locations 42, and 45 in ISO drawing. 2. Corrosion was noted at contact area between piping and support, marked as locations 43 and 44 in ISO drawing. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	1. To perform surface preparation and follows by maintenance painting as per client's specification. 2. To lift the piping, perform surface preparation and follows by maintenance painting as per client's specification for location 43 and permanent repair at location 43 with remove the corrosion, restore with weld metal deposited/insert weld patch, follow by NDE and re-painting as per client's specification. Note:-Pits depth measurement at contact area between piping and support based on estimation due to inaccessible area.

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VISUAL INSPECTION FINDINGS AND RECOMMENDATIONS
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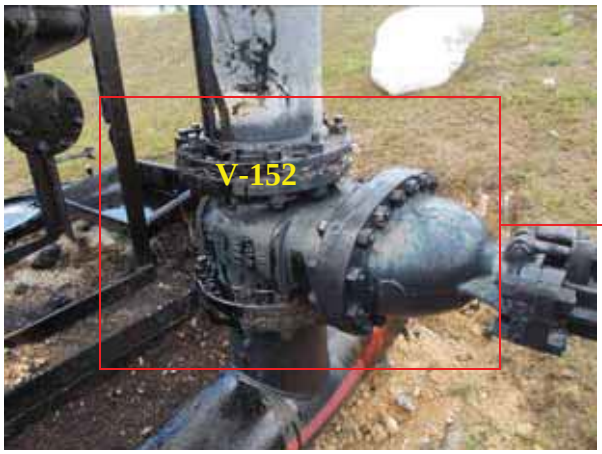
PHOTO NO. : 6



LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6	ISO drawing no. 14
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Stud bolts of flanges V-149 was noted not extend out through their nut. 2. Stud bolts of flanges V-152 was noted to be missing.	1. To replace with longer stud bolt with the same material and specification. 2. To replace the missing stud bolt with the same material and specification

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PHOTO NO. : 7

LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6	ISO drawing no. 14
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1935 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Remnant tack weld was noted at side section of piping.	To grind flush and follows by maintenance painting as per client's specification.

Prepared By : *MOHD. KHAIRI*

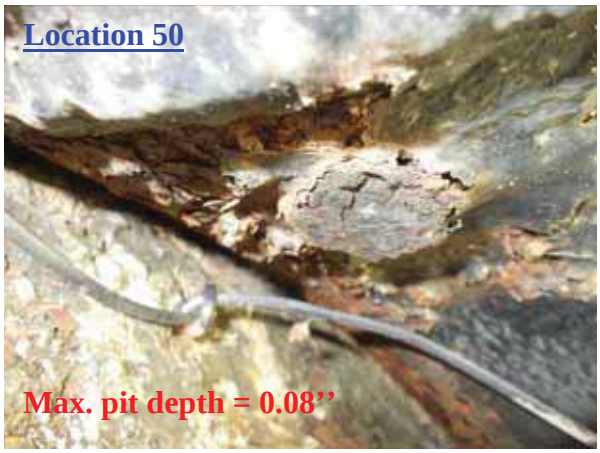
LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6	ISO drawing no. 14
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1934 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Temporary repair was noted at bottom section of piping. According to API 570 paragraph 8.1.4.1, *the design of temporary enclosures and repair shall be approved by piping engineer and temporary repairs should be removed and replaced with a suitable permanent repair at the next available maintenance opportunity*.	Consideration to perform permanent repair in accordance to API 570, restore with weld metal deposited/insert weld patch follows by NDE and painting as per client's specification.

Prepared By : *MOHD. KHAIRI*

PHOTO NO. : 9

LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6	ISO drawing no. 15
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1935 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Corrosion under wrapping was noted at soil to air interface area due to wrap failure and gives a path to water ingress inside, marked as location 46 in ISO drawing. No sign of corrosion propagate deeper after the wrapping end. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	To perform surface preparation extend to the last corrosion, apply coal tar enamel and re-wrap with proper procedure and suitable wrapping for buried piping up to 6'' from soil to air interface.

Prepared By : *MOHD. KHAIRI*



LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6	ISO drawing no. 15
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1935 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Localized corrosion/pits was noted at side and bottom section of piping, marked as locations 47 and 48 in ISO drawing. 2. Corrosion was noted at contact area between piping and support, marked as location 49 and 50 in ISO drawing. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	1. Consideration to perform permanent repair in accordance to API 570, restore with weld metal deposited/insert weld patch follows by NDE and painting as per client's specification. 2. To lift the piping, perform surface preparation and follows by maintenance painting as per client's specification for location 50 and permanent repair as above for location 49. Note:-Pits depth measurement at contact area between piping and support based on estimation due to inaccessible area. .

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VISUAL INSPECTION FINDINGS AND RECOMMENDATIONS
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PHOTO NO. : 11

LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6	ISO drawing no. 15
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1935 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Severe crevice corrosion between flanges V-134.	To monitor periodically for leaking or to dismantle the valve and check for corrosion at raise face and replace with new gasket. To replace all corroded stud bolts with the same material and specification.

Prepared By : *MOHD. KHAIRI*

PHOTO NO. : 12

LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6	ISO drawing no. 15
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1935 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Stud bolts of flange was noted not extend out through their nut. 2. Stud bolts of flanges was noted to be missing.	1. To replace with longer stud bolt with the same material and specification. 2. To replace the missing stud bolt with the same material and specification

Prepared By : *MOHD. KHAIRI*

Between support 25 & 26

Between support 31 & 32

Between support 32 & 33

Between support 33 & 34

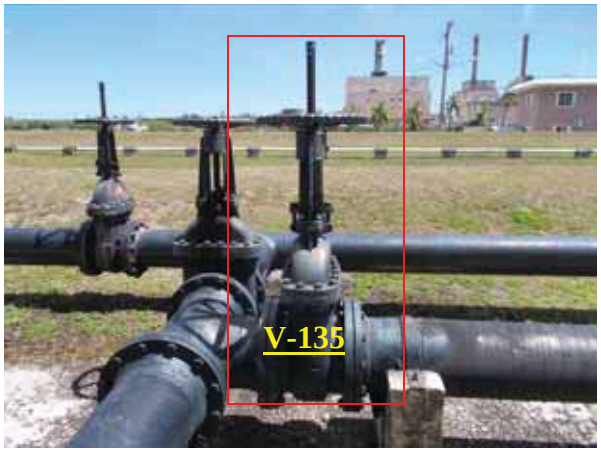
LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6	ISO drawing no. 15
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1935 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Remnant tack weld was noted on top and side section of piping.	To grind flush and follows by maintenance painting as per client's specification.

Prepared By : *MOHD. KHAIRI*

LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6	ISO drawing no. 15
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 19345Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Temporary repair was noted at bottom section of piping. According to API 570 paragraph 8.1.4.1, *the design of temporary enclosures and repair shall be approved by piping engineer and temporary repairs should be removed and replaced with a suitable permanent repair at the next available maintenance opportunity*.	Consideration to perform permanent repair in accordance to API 570, restore with weld metal deposited/insert weld patch follows by NDE and painting as per client's specification.

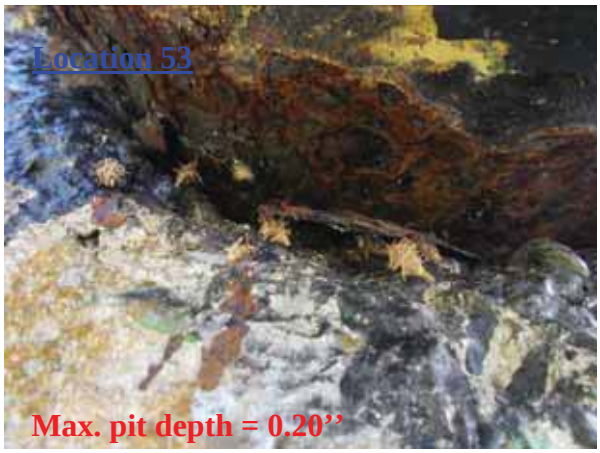
Prepared By : *MOHD. KHAIRI*

PHOTO NO. : 15



LINE SERVICE	DRAWING REFERENCE
12'' (B) Residual Fuel Oil No. 6	ISO drawing no. 16
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1935 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Stud bolts of valve was noted corroded. 2. Paint failure with surface rust was noted at some section of the valve.	1. To replace the corroded stud bolts with the same material and specification. 2. To perform surface preparation and follows by maintenance painting as per client's specification.

Prepared By : *MOHD. KHAIRI*

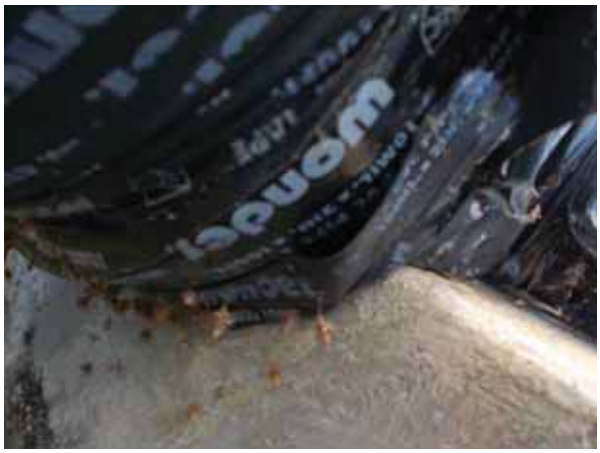


LINE SERVICE	DRAWING REFERENCE
12'' (A) Residual Fuel Oil No. 6	ISO drawing no. 16
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1935 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Corrosion was noted at contact area between piping and support, marked as locations 51, 52, 53 and 54 in ISO drawing. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	To lift the piping and perform surface preparation and follows by maintenance painting as per client's specification for location 51 and 54. Consideration to perform permanent repair at locations 52 and 53 with remove the corrosion, restore with weld metal deposited/insert weld patch, follow by NDE and re-painting as per client's specification.

Prepared By : *MOHD. KHAIRI*

LINE SERVICE	DRAWING REFERENCE
12'' (A) Residual Fuel Oil No. 6	ISO drawing no. 16
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1935 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Corrosion was noted at contact area between piping and support, marked as location 55 in ISO drawing. 2. Corrosion under wrapping was noted at soil to air interface area due to wrap failure and gives a path to water ingress inside, marked as location 56 in ISO drawing. No sign of corrosion propagate deeper after the wrapping end. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	1. To lift the piping and consideration to perform permanent repair at locations with remove the corrosion, restore with weld metal deposited/insert weld patch, follow by NDE and re-painting as per client's specification. 2. To perform surface preparation extend to the last corrosion, apply coal tar enamel and re-wrap with proper procedure and suitable wrapping for buried piping up to 6'' from soil to air interface.

Prepared By : *MOHD. KHAIRI*

Before support 38 	Between support 40 & 41 
At support 43 	

LINE SERVICE	DRAWING REFERENCE
12'' (A) Residual Fuel Oil No. 6	ISO drawing no. 16
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1935 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Remnant tack weld was noted at side section of piping. 2. Temporary repair was noted at bottom section of piping. According to API 570 paragraph 8.1.4.1, *the design of temporary enclosures and repair shall be approved by piping engineer and temporary repairs should be removed and replaced with a suitable permanent repair at the next available maintenance opportunity*.	1. To grind flush and follows by maintenance painting as per client's specification. 2. Consideration to perform permanent repair in accordance to API 570, restore with weld metal deposited/insert weld patch follows by NDE and painting as per client's specification.

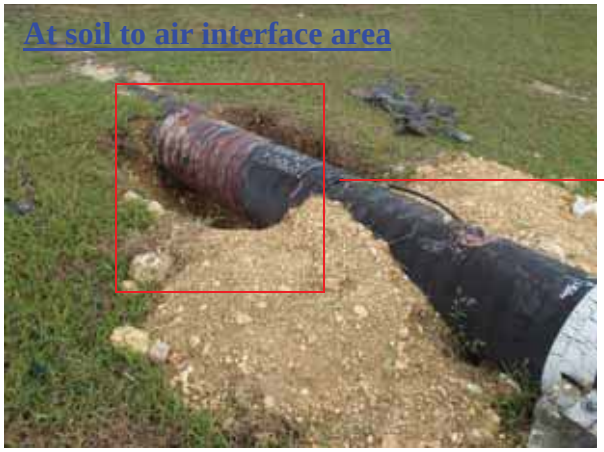
Prepared By : *MOHD. KHAIRI*

At support 37 	At support 38 
At support 41 	At support 43 

LINE SERVICE	DRAWING REFERENCE
12'' (B) Residual Fuel Oil No. 6	ISO drawing no. 16
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1935 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Wrapping tape was observed not intact, however no sign of corrosion was noted at the area.	To tidy up the wrapping and ensure without gap to avoid water ingress inside and promote to corrosion.

Prepared By : *MOHD. KHAIRI*

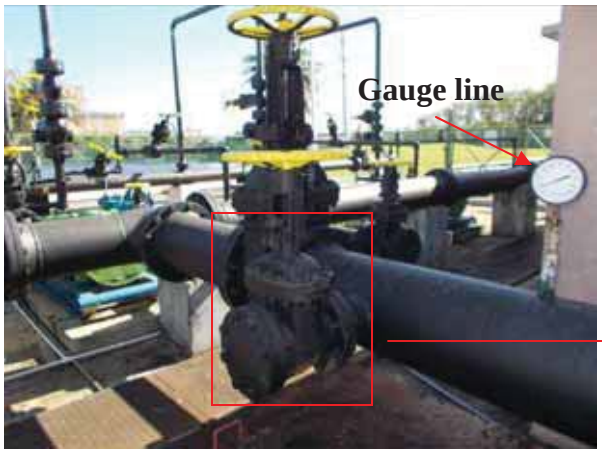
PHOTO NO. : 20



LINE SERVICE	DRAWING REFERENCE
12'' (B) Residual Fuel Oil No. 6	ISO drawing no. 16
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Tank 1935 Farm Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Wrapping tape was noted not intact especially on top section of piping, however no sign of corrosion at the area.	Consideration to apply coal tar enamel and re-wrap with proper procedure and suitable wrapping for buried piping up to 6'' from soil to air interface.

Prepared By : *MOHD. KHAIRI*

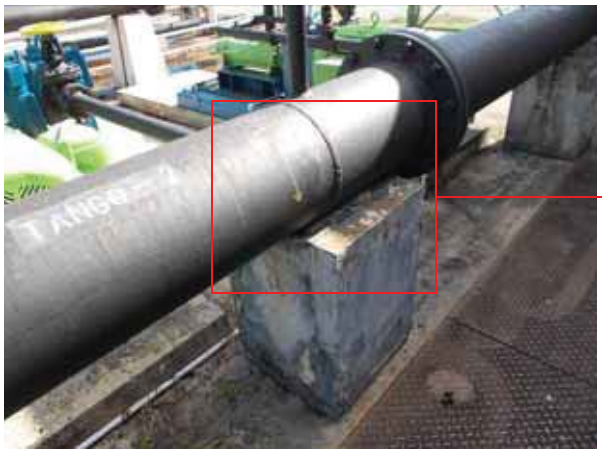
PHOTO NO. : 21



LINE SERVICE	DRAWING REFERENCE
12'' (B) Residual Fuel Oil No. 6	ISO drawing no. 17
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Pump Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Wrapping tape at concrete to air interface was observed deteriorated and minor corrosion under wrapping was noted at the area. 2. Paint failure with surface rust was noted at some section of 6'' valve. 3. Small bore piping (gauge line) was noted without gusset plates.	1. To un-install the wrapping, perform surface preparation, painting as per client's specification and re-wrap at concrete to air interface area (6'' above from ground level) with proper procedure. 2. To perform surface preparation and follows by maintenance painting as per client's specification. 3. To install 2 gusset plates on the piping to strengthen the pressure line. *Please refer ISO Drawing for detail location base on reference support/area as stated above.*

Prepared By : *MOHD. KHAIRI*

PHOTO NO. : 22



LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6	ISO drawing no. 17
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Pump Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Excessive in contact between piping and support. Crevice corrosion was noted at support 2.	To lift the piping, perform surface preparation and follows by maintenance painting as per client's specification. Consideration to modify existing support and to install rounded/angle bar or other materials to give single contact point between piping and support. Single contact point is to prevent moisture or water sitting against the piping surface and promote to corrosion.

Prepared By : *MOHD. KHAIRI*

PHOTO NO. : 23

LINE SERVICE	DRAWING REFERENCE
3'' Residual Fuel Oil No. 6	ISO drawing no. 17
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Pump Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Wrapping tape at 5''x3'' was observed deteriorated and minor corrosion under wrapping was noted at the area. 2. Stud bolts and nuts at 3'' valve inlet to Tango 2 pump was noted corroded.	1. To un-install the wrapping, perform surface preparation, painting as per client's specification. 2. To replace the corroded stud bolts and nuts with the same material and specification.

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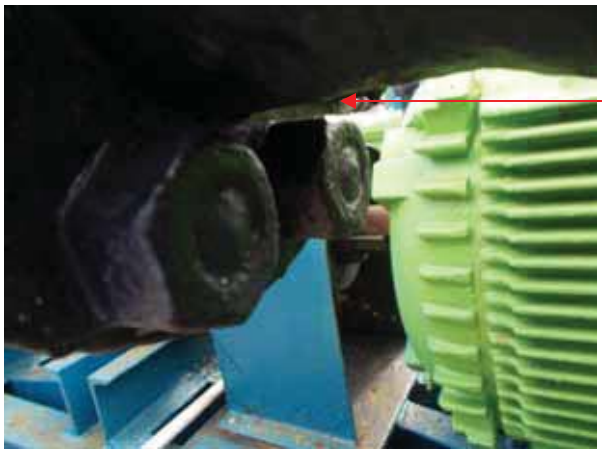


LINE SERVICE	DRAWING REFERENCE
3'' Residual Fuel Oil No. 6	ISO drawing no. 17
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Pump Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Stud bolts of 3'' valve was noted not extend out from their nuts and corroded.	To replace the stud bolts and nuts with the same material and specification.

Prepared By : *MOHD. KHAIRI*

PHOTO NO. : 25

LINE SERVICE	DRAWING REFERENCE
12'' (A) Residual Fuel Oil No. 6	ISO drawing no. 18
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Pump Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Wrapping tape at concrete to air interface was observed deteriorated and corrosion under wrapping was noted at the area. 2. Small bore piping (gauge line) was noted without gusset plates.	1. To un-install the wrapping, perform surface preparation, painting as per client's specification and re-wrap at concrete to air interface area (6'' above from ground level) with proper procedure. 2. To install 2 gusset plates on the piping to strengthen the pressure line. *Please refer ISO Drawing for detail location base on reference support/area as stated above.*

Prepared By : *MOHD. KHAIRI*

PHOTO NO. : 26

LINE SERVICE	DRAWING REFERENCE
12'' (A) Residual Fuel Oil No. 6	ISO drawing no. 18
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Pump Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Product stain sign of leak was noted at flanges joint to 12'' valve. 2. Stud bolts of 6'' valve was noted not extend out from their nuts and corroded at 12'' valve.	1. Consideration to dismantle the valve to check for corrosion at raise face and to replace with new gasket. 2. To replace with longer stud bolt for 6'' valve and to replace corroded nuts at 12'' valve. *Please refer ISO Drawing for detail location base on reference support/area as stated above.*

Prepared By : *MOHD. KHAIRI*

LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6	ISO drawing no. 18
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Pump Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Excessive in contact between piping and support. Crevice corrosion was noted at support 5.	To lift the piping, perform surface preparation and follows by maintenance painting as per client's specification. Consideration to modify existing support and to install rounded/angle bar or other materials to give single contact point between piping and support. Single contact point is to prevent moisture or water sitting against the piping surface and promote to corrosion. *Please refer ISO Drawing for detail location base on reference support/area as stated above.*

Prepared By : *MOHD. KHAIRI*

LINE SERVICE	DRAWING REFERENCE
12'' Residual Fuel Oil No. 6	ISO drawing no. 18
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Pump Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Wrapping tape at support was noted deteriorated. 2. Excessive in contact between piping and support.	1. To uninstall the wrap for preventing water ingress inside and promote to corrosion. 2. Consideration to modify existing support and to install rounded/angle bar or other materials to give single contact point between piping and support. Single contact point is to prevent moisture or water sitting against the piping surface and promote to corrosion.

Prepared By : *MOHD. KHAIRI*

LINE SERVICE	DRAWING REFERENCE
6'' Residual Fuel Oil No. 6	ISO drawing no. 18
DESCRIPTION	**LOCATION**
Circuit 3 - Fuel supply line	Inside Terminal – Pump Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Localized corrosion/pits was noted at bottom section of piping, marked as location 57 in ISO drawing. **Please refer Appendix 2 for ½ remaining life calculation at pits area.*	To perform surface preparation and follows by maintenance painting as per client's specification.

Prepared By : *MOHD. KHAIRI*

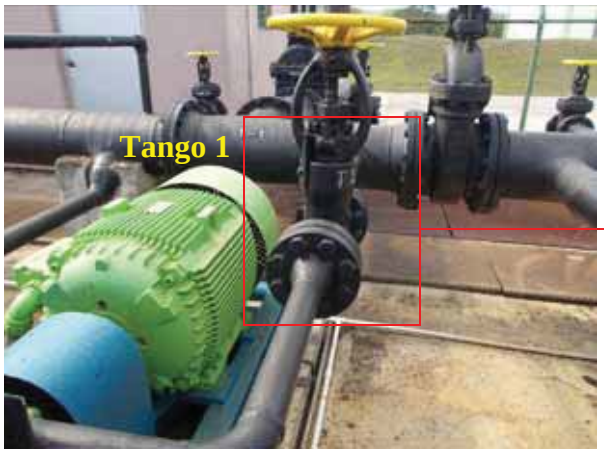
INSIDE TERMINAL
Circuit 4
- Tango line -

VISUAL INSPECTION FINDINGS AND RECOMMENDATIONS
WITH PHOTOGRAPHS
VITAL ENERGY, GUAM, U.S.A

PHOTO NO. : 1

LINE SERVICE	DRAWING REFERENCE
14'' Residual Fuel Oil No. 6	ISO drawing no. 19 to 23
DESCRIPTION	**LOCATION**
Circuit 4 - Tango Line	Inside Terminal – Pump and outside pump area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. General view of 8'' Tango line outlet from T -1, T - 2 and T 3 pump. 2. Excessive in contact between piping and all pedestals support.	1. Nil. 2. Consideration to modify existing support and to install rounded/angle bar or others material to give single contact point between piping and support. Single contact point is to prevent moisture or water sitting against the piping surface and promote to corrosion.

Prepared By : *MOHD. KHAIRI*



LINE SERVICE	DRAWING REFERENCE
3'' Residual Fuel Oil No. 6	ISO drawing no. 19
DESCRIPTION	**LOCATION**
Circuit 4 - Tango line	Inside Terminal – Pump Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
Stud bolts of 2'' valve for by pass line was observed not extend out from their nuts.	To replace with longer stud bolts with the same material and specification.

Prepared By : *MOHD. KHAIRI*

VISUAL INSPECTION FINDINGS AND RECOMMENDATIONS
WITH PHOTOGRAPHS
VITAL ENERGY, GUAM, U.S.A

PHOTO NO. : 3

LINE SERVICE	DRAWING REFERENCE
4'', 8'' Residual Fuel Oil No. 6	ISO drawing no. 19
DESCRIPTION	**LOCATION**
Circuit 4 - Tango line	Inside Terminal – Pump Area **Please refer Appendix 3 for detail location*
FINDING	**RECOMMENDATIONS**
1. Pipe support modification was noted from support 4 to 7 and surface rust was noted at the area. 2. Wrapping tape at underground piping was observed intact, no sign of corrosion was noted at the wrapping area.	1. To perform surface preparation and follows by maintenance painting as per client's specification. 2. Nil.

Prepared By : *MOHD. KHAIRI*