REPORT

OPTIONS ANALYSIS: UPGRADE OF MASTERCOM RADIOS FOR EMERGENCY RESPONSE

GAS-999-RP-EM-017

Revision Number: 0
Revision Date: 8/05/2024

Jemena
bringing energy to life

DOCUMENT HISTORY

Revision	Date	Author	Description of Changes
0	08/05/2024		Developed for AA

OWNING FUNCTIONAL GROUP AND DEPARTMENT / TEAM

Gas Distribution : Asset & Operations

TABLE OF CONTENTS

EXECUTIVE SUMMARY 4
1. INTRODUCTION 5
1.1 PURPOSE 5
1.2 OBJECTIVES 5
2. PROJECT DETAILS 6
2.1 PROJECT BACKGROUND 6
2.2 KEY DRIVERS 6
2.2.1 OBSOLESCENCE 6
2.2.2 RELIABILITY 6
3. CREDIBLE OPTIONS 7
3.1 OPTION 1: MAINTAIN STATUS QUO 7
3.1.1 SCOPE 7
3.1.2 BENEFITS 7
3.1.3 LIMITATIONS 7
3.1.4 SUMMARY 7
3.2 OPTION 2: REPLACE 3000 WITH 4000 SERIES RADIOS IN ONE YEAR. 7
3.2.1 SCOPE 7
3.2.2 BENEFITS 7
3.2.3 LIMITATIONS 8
3.2.4 SUMMARY 8
3.3 OPTION 3: REPLACE 3000 WITH 4000 SERIES RADIOS EVENLY SPREAD 4 YEARS. 8
3.3.1 SCOPE 8
3.3.2 BENEFITS 8
3.3.3 LIMITATIONS 8
3.3.4 SUMMARY 8
3.4 COMPARISON OF OPTIONS 9
4. RECOMMENDATION 11
4.1 RECOMMENDED SOLUTION 11
APPENDIX A : RISK ASSESSMENT SUMMARY 12

EXECUTIVE SUMMARY

This document provides options for Jemena in addressing a cost and functional analysis of the available two-way radio system supplied by the Jemena Gas Network (JGN) to be used by Zinfra Gas Services (ZGS) across the JGN gas distribution system and identify the most prudent option to address the key issue.

Zinfra Gas Services (ZGS) is using a two-way radio system across Jemena Gas Network (JGN) for emergency response communications with the Jemena Control Room. The radio system also enables the Control Room to have location visibility of the ZGS field resources. The radios used by ZGS are a combination of 221 [redacted] 3000 and 229 of 4000 series models. The 2 series radios are running on 2 different networks.

3000 series [redacted] radios went out of support from the manufacturer since 2019. Also [redacted] is only running the 3000 series for JGN as the only network user, other users have transferred to 4000 series network.

Therefore, the reliability of two-way communications and location visibility of ZGS field resources using the 3000 series [redacted] radios for emergency response is at risk.

There are two (2) key drivers associated with the situation as following :

1) Obsolescence – Network of 3000 series [redacted] radios is currently sitting on 3000 series network, [redacted] is only running the 3000 series for JGN as the only network user. The 3000 series also went out of support from the manufacturer since 2019.
2) Reliability – The radio system enables the Control Room to have location visibility of the ZGS field resources equipped with either vehicle mounted and handheld two-way radios. This is a critical requirement for gas emergency response to ensure that the closest resources are identified and mobilised to an incident location. 3000 series radio is less reliable compared to 4000 series from both hardware and applied network point of view.

Three (3) options have been assessed to address the issues and risks identified in accordance with the Group Risk Management Manual[1], ensuring the most effective solution is selected to ensure safe operation and reliability of the asset. Without an adequate solution, there is an untreated risk rating of SIGNIFICANT, which is above Jemena's risk threshold.

The three (3) options are :

- Option 1 – Maintain Status Quo.
- Option 2 – Replace 3000 series with 4000 series [redacted] radios in one year.
- Option 3 – Replace 3000 series with 4000 series [redacted] radios evenly spread over 4 years.

Option 3 has been identified as the most effective solution in targeting all the project drivers to maintain a duty of care, safe operation and reliability of the asset.

[1] JAA MA 0050 – Group Risk Management Manual Revision 10 : 22/05/2023

1. INTRODUCTION

1.1 PURPOSE

The purpose of this document is to summarise the available options in addressing a cost and functional analysis of the available two-way radio system supplied by the Jemena Gas Network (JGN) to be used by Zinfra Gas Services (ZGS) across the JGN gas distribution system and identify the most prudent option to address the key issues required to improve safety and reliability obligations.

1.2 OBJECTIVES

The objectives of this project are to :

- Improve / maintain field communication by replacing 3000 series with 4000 series [redacted] radios with the respective network to enable stable traceability and visibility of field resources.

2. PROJECT DETAILS

2.1 PROJECT BACKGROUND

Mastercom is the vendor for provision and support of the 2-way radio system used by Zinfra Gas Services (ZGS) across the Jemena Gas Network (JGN) for emergency response communications with the Jemena Control Room.

The radio system also enables the Control Room to have location visibility of the ZGS field resources equipped with either vehicle mounted and handheld 2-way radios. This a critical requirement for gas emergency response to ensure that the closest resources are identified and mobilised to an incident location within 30 minutes.

The 30-minute requirement is an internal KPI (Key Performance Indicators) set by Jemena that has been established to ensure compliance with the regulatory KPI of 60 minutes.

The radios used by ZGS are a combination of 221 [redacted] 3000 and approx.229 of 4000 series models. The 3000 series went out of support from the manufacturer [redacted] in 2019. The 3000 and 4000 series radios are also operating off two different [redacted] networks. Mastercom is maintaining the network used for the 3000 series on a goodwill basis as JGN is the only customer still using this network.

2.2 KEY DRIVERS

There are two (2) key drivers associated with this project:

2.2.1 OBSOLESCENCE

The 3000 series radio went out of support from the manufacturer [redacted] in 2019. The 3000 and 4000 series radios are also operating off two different [redacted] networks. Mastercom is maintaining the network used for the 3000 series on a goodwill basis only as JGN is the only customer still using this network. Therefore the driver is to minimise the risk of field communication failure due to equipment and network obsolescence.

2.2.2 RELIABILITY

Compare with 3000 series, the 4000 series radio provides more functionality, sit on a more stable network which provides better communication, and more stable traceability and visibility of field resources. It's compatible with 3G/4G network in rural areas. It can be remotely configured to turn on/off with vehicle ignition with an automated system.

Jemena Emergency Response requires 2 discrete forms of communication which are radios and phones. The recent Optus outage shows benefits and importance of having a separate system with radios. Radios also provide visibility of field resources for emergency response as radios are a completely different system and network and not dependent on phone networks.

Radio networks also provide the ability for better situational awareness as they can be operated on an open network allowing all radios to hear at the same time the information being transferred.

3. CREDIBLE OPTIONS

To mitigate risks associated with radio system and to address project drivers, the following three (3) options were identified and evaluated, ensuring the most effective solution is proposed to maintain a duty of care, maintain safe operation and reliability of the asset.

- Option 1: Maintain Status Quo
- Option 2: Replace 3000 series with 4000 series [redacted] radios in one year.
- Option 3: Replace 3000 series with 4000 series [redacted] radios evenly spread over 4 years.

3.1 OPTION 1: MAINTAIN STATUS QUO

3.1.1 SCOPE

Do nothing and leave the radio systems as is, accepting outdated radios technology and associated risks.

3.1.2 BENEFITS

- This option incurs no additional CAPEX.

3.1.3 LIMITATIONS

This option does not address any of the project drivers or risks associated with outdated radios technology.

- The 3000 series radios are not supported from the manufacturer which could lead to slow replacement time when any technical issue occurred to these radios in field.
- JGN is the only user of the 3000 series radios network which may lead to less [redacted] resource allocated to operating this network that could cause unstable communication between field and with Jemena Control Room.

3.1.4 SUMMARY

This option is unacceptable due to the risk ranking remaining SIGNIFICANT and limitations as described above.

3.2 OPTION 2: REPLACE 3000 WITH 4000 SERIES RADIOS IN ONE YEAR.

3.2.1 SCOPE

This option provides replacement of 3000 series with 4000 series [redacted] radios in one year.

3.2.2 BENEFITS

- Compare with 3000 series, the 4000 series radio provides more functionality, sit on a more stable network which provides better communication, and more stable traceability and visibility of field resources.

- It's compatible with 3G/4G network in rural areas. It can be remotely configured to turn on/off with vehicle ignition with an automated system.
- Ensure safety, compliance requirements and obligations are adhered with filed communication for gas emergency response to ensure that the closest resources are identified and mobilised to an incident location.

3.2.3 LIMITATIONS

High CAPEX in one year.

3.2.4 SUMMARY

This option will improve the communication and visibility resources, but with higher cost in one year therefore come with less consistent capex planning.

3.3 OPTION 3: REPLACE 3000 WITH 4000 SERIES RADIOS EVENLY SPREAD OVER 4 YEARS (RY27-30)

3.3.1 SCOPE

This option provides replacement of 3000 series with 4000 series [redacted] radios evenly spread over 4 years in RY27 to RY30.

3.3.2 BENEFITS

- Compare with 3000 series, the 4000 series radio provides more functionality, sit on a more stable network which provides better communication, and more stable traceability and visibility of field resources.
- It's compatible with 3G/4G network in rural areas. It can be remotely configured to turn on/off with vehicle ignition with an automated system.
- Ensure safety, compliance requirements and obligations are adhered with filed communication for gas emergency response to ensure that the closest resources are identified and mobilised to an incident location.
- Providing evenly spread cost over 4 year instead of high cost in one year.

3.3.3 LIMITATIONS

CAPEX spread in 4 years.

3.3.4 SUMMARY

This option will significantly improve the communication stability with traceability and visibility of field resources, therefore adequately addresses all project drivers and mitigating associated risks.

3.4 COMPARISON OF OPTIONS

Criteria	Option 1	Option 2	Option 3
Option Description	**Maintain Status Quo & Accept the Associated Risks**	**Replace 3000 series with 4000 series [redacted]radios in one year**	**Replace 3000 series with 4000 series [redacted]radios evenly spread over 4 years**
Benefits	* No additional CAPEX Cost.	* Compare with 3000 series, the 4000 series radio provides more functionality, sit on a more stable network which provides better communication, and more stable traceability and visibility of field resources. * It's compatible with 3G/4G network in rural areas. It can be remotely configured to turn on/off with vehicle ignition with an automated system. * Improve field communication by replacing 3000 series with 4000 series [redacted]radios with the respective network to enable stable traceability and visibility of field resources. * Ensure safety, compliance requirements and obligations are adhered with filed communication for gas emergency response to ensure that the closest resources are identified and mobilised to an incident location.	* Compare with 3000 series, the 4000 series radio operates more functionality, sit on a more stable network which provides better communication, and more stable traceability and visibility of field resources. * It's compatible with 3G/4G network in rural areas. It can be remotely configured to turn on/off with vehicle ignition with an automated system. * Improve field communication by replacing 3000 series with 4000 series [redacted]radios with the respective network to enable stable traceability and visibility of field resources. * Ensure safety, compliance requirements and obligations are adhered with filed communication for gas emergency response to ensure that the closest resources are identified and mobilised to an incident location. * Providing evenly spread cost in 4 year instead of high cost in one year.
Limitations	* The 3000 series radios are not support from the manufacturer which could lead to slow replacement time	* High CAPEX in one year.	* CAPEX spread in 4 years.

	when any technical issue occurred to these radios in field. * JGN is the only user of the 3000 series radios network which may lead to less resource allocated to operating this network that could cause unstable communication between field and with Jemena Control Room.		
Criteria	**Option 1**	**Option 2**	**Option 3**
CAPEX Cost	Nil	$1M in one year	$1M in four year
Treated Risk Ranking	**SIGNIFICANT**	**MODERATE**	**LOW**
Recommendation Ranking	3 Unacceptable as risk remains SIGNIFICANT	2 Acceptable but have high capex in one year.	**1** **Recommended / Preferred Option**

4. RECOMMENDATION

4.1 RECOMMENDED SOLUTION

The recommended solution is Option 3, which is to replace all 3000 series with 4000 series [redacted] radios evenly spread over 4 years.

APPENDIX A : RISK ASSESSMENT SUMMARY

A risk assessment was conducted to determine the level of risk severity of the untreated risk. The table below shows the summary of results and then the treated risk summary for each option. The risk assessment was undertaken in accordance with the Jemena Risk Manual JAA MA 0050 Revision 10 (22/05/2023).

UNTREATED IMPACT/CONSEQUENCES								UNTREATED RISK SUMMARY		
Contributing Factors/ Scenario	Financial	Operational	Health, Safety & Environment	Employee	Regulatory & Compliance	Brand/ Reputation/ Stakeholders	Comments	Consequence (Highest Impact)	Likelihood	Risk Level
The 3000 series radios are not support from the manufacturer which could lead to slow replacement time when any technical issue occurred to these radios in field.	Minor	Minor	n/a	n/a	Minor	n/a	• FINANCIAL: MINOR – maintenance cost over 24 months. • OPERATONAL: MINOR – BaU interruption for a few hours due to radio failure	Minor	Almost Certain	MODERATE
3000 series radios and its network being outdated technology may lead to unstable communication between field and with Jemena Control Room.	n/a	n/a	Severe	n/a	Minor	Severe	• SAFETY: Severe - field staff unable to quickly communicate to control room in emergency situation due to radio failure • REPUTATION: Severe - Significant adverse public attention and heightened concern from stakeholders due to unable to quickly respond to emergency due to radio failure • LIKELIHOOD: Possible	Severe	Possible	SIGNIFICANT

TREATED RISK SUMMARY

Treated risk	Benefit	Key Mitigations	Consequence	Likelihood	Risk Level
Option 3 – Upgrade radio series 3000 to 4000 to ensure better communication with the latest support	• Eliminates the risk for manufacturer to support • Significantly improve the network communicate • Significantly improve traceability and visibility of field resources	Upgrade radio series 3000 to 4000	Minor	Unlikely	Low