LUSAIL DEVELOPMENT

Gas Distribution System Risk Assessment Guidelines for Mega-development

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REASON FOR ISSUE:

- **IFR** Issued for Review/Comment(s)
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STATUS

- **PFC** Preliminary for Comment
- **A** Approved
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1 INTRODUCTION

This document shows the scope of Risk Assessment that Marafeq require the Mega-developer to carry out on the gas network that they are responsible for within their districts. The risk assessment must be carried out by a Risk Assessment Specialist.

2 SCOPE

The limits of the Risk Assessment are from the Marafeq provided tie-in points to the primary pressure stations within the individual plots.

3 CODES AND STANDARDS

The Risk Assessment must be carried out according to the following codes and standards.

- IGE/TD/3 Edition 4 Steel and PE pipelines for gas distribution.
- IGE/TD/3 Edition 4 amendments issued 2005.
- IGE/TD/4 Edition 3 Gas services.
- IGE/TD/4 Edition 4: PE and Steel gas services and service pipe work.
- IGE/TD/3 Edition 4 Supp1: Handling, transport and storage PE pipes and fittings.
- IGE/GL/9: Guidance for large consumers in dealing with Natural gas supply emergencies.
- IGE/SR/24: Risk assessment techniques.
- IGE/SR/25: Hazardous area classification of Natural gas installations.
- IGEM/TD/13 Ed 2: Pressure regulating installations for Natural Gas, Liquefied Petroleum Gas and Liquefied Petroleum Gas/Air.
- IGE/SR/23 2nd Imp: Venting of Natural Gas.
- All IGE related Amendments and updates in September 2011.

- NFPA 58: Liquefied Petroleum Gas Code, 2011 Edition.
- NFPA 59: Utility LP-Gas Plant Code Latest Edition
- NFPA 54: National Fuel Gas Code. 2011 Edition.
- LPGA: Liquid Petroleum Gas Association United Kingdom.
- WOQOD Gas Department Regulations.

4 REQUIREMENTS

The following points must be covered within the risk assessment:

- The design criterion has been taken from IGE TD3 Edition 4 section 5.1.1.
- In all matters the overriding objective is safety.
- Adoption of best internal practices utilizing appropriate modern technology.

In addition the design principles must include:

- Protection of customers, public, property and environment from injury damage or harm.
- Assurance of a safe reliable, effective, efficient and secure supply of gas to consumers.

These principles shall be achieved by:

- Making provisions to reasonable mitigate the risk and consequences of the system failure, naturally occurring hazards or third party interference.
- Ensuring that any design is appropriate to service current demands yet flexible enough to serve markets that are identified as being available during the design period.
- Ensuring that the scope of impact of failure of one or more components on the gas supply to consumers can be controlled and localized.
- Minimizing the complexity of the system from both the construction and operational stand points.

5 METHODOLOGY

The Risk Assessment must be delivered through assessing the capability of the planned network to meet the future gas load whilst meeting the agreed minimum acceptable delivery pressures to end users. The network must be reviewed for the following situations:

- Synthetic Natural Gas (SNG) at 2 bar maximum operating pressure.
- Synthetic Natural Gas (SNG) at 2.4 bar maximum operating pressure.
- Natural Gas (NG) at 4 bar maximum operating pressure.

The sub-developer must undertake a full technical and safety review to ensure that the design is 'fit for purpose' and meets the minimum requirements detailed in IGEM/TD/3 and international best practice where appropriate paying particular attention to:

- General Design configuration.
- The amount of gas released impacting on the consequence of any pipeline failure.
- The minimum proximity distance to normally occupied buildings.
- The minimum proximity distance to other utilities.
- Depth of Pipeline.
- Strategic Valves.
- Emergency valves.
- Special Crossings.
- Security of Supply.
- Service design and Isolation.
- International best practice.
- Pipeline routing.
- Pipe diameter.
- Pipe length.
- Location of inline valves.
- Service connections.

- Location of Primary metering stations.
- The pipeline testing, purging and commissioning techniques and calculations.
- The maintenance and operation for the network.