

RISK ASSESSMENT AND RISK MANAGEMENT PLAN

Risk Description	Rating	Mitigation Measures	Responsibility
Technical and Safety Risks			
1. Low understanding of the new AMI systems leading to improper operation, maintenance and data analysis	S	MEC to provide crews capable of handling computer systems and troubleshooting communications. Supplier to provide adequate training for proper (i) operation, (ii) maintenance, and (iii) analysis of gathered data resulting in operation action. Supervising consultant to report adequacy of the initial training, to recommend changes before commissioning stage, and assess final MEC AMI knowledge capacity before project closure.	MEC, Supplier, Supervising consultants
2. Lack of local smart metering standards leading to suboptimal quality installations	S	Tendering documents will be assembled following internationally accepted standards. Supplier will then provide training to MEC crews on required standard of AMI installations. Finally, supervising consultants will ensure that international standards are followed.	Supervising consultants, Supplier
3. Lack of safety standards leading to injuries of MEC crews and destruction of installed equipment and existing MEC assets	M	MEC to provide properly trained and experienced crews. Supplier to include safety installation practices into the initial training for installation of the supplied equipment. Supervising consultants to provide feedback on the installation practices during the initial installation phase. In addition, MEC to provide a safety observer who can be trained together with distribution crews.	MEC, Supplier, Supervising consultants
4. Local communication infrastructure (4G network) not reliable, hence not suitable for future AMI network	M	Supplier and Supervising consultants to assess NTA's network ability to support additional 500 devices on its network. Equipment supplier will be expected to provide equipment capable of handling drop-outs of 4G communications. Alternatively, NTA's optical network and possibility of renting parts of it for MEC purposes to be investigated. Finally, viable communication methods will be accepted and assessed in the tender.	MEC, Supplier, Supervising consultants
5. Low reliability of the supplied and installed equipment in the AMI center, resulting in uncollected data or dropout of many AMI devices across the network	M	Redundant equipment to be specified by supervising consultants and provided by the supplier (data concentrators and server computers). Only proven, high quality equipment to be used.	Supplier, Supervising consultants
6. Poor technical input at specification phase leads to technical failure	L	The PMU will be adequately staffed with technical expertise to prepare	ADB, MEC, Supervising consultants

		satisfactory technical specifications for tendering.	
7. Lack of proper distribution training or proper installation tools leading to suboptimal quality installations	L	MEC has skilled distribution crews which can conduct regular operation and maintenance of the distribution grid. In addition, supplier will be required to provide proper installation tools, and will provide training on the installation of AMI equipment, using provided tools.	MEC, Supervising consultants, Supplier
Human Resources / Community Risks			
8. Insufficient capacity within the executing agency to manage the project up to ADB procurement procedures.	M	PMU will be supported by international consultants: (i) a project management/technical specialist, (ii) a procurement specialist.	ADB, MEC, Supervising consultants
9. Low capacity of local MEC electrical crews resulting in suboptimal quality installations	M	Local MEC crews will be trained for two weeks and supervised by provider of equipment (tenderer). Initial work will be supervised, and commissioning of all devices will be confirmed by the tenderer. If any defects are identified at the beginning of the installation period, supervision consultants would raise the issue, making sure all defects are corrected by commissioning.	Supplier, supervising consultants
10. Landowner disputes or community dissatisfaction delays or stops project execution	L	Installation of equipment will be on existing infrastructure and will be under current agreements between MEC and landowners. Community will be informed on the installation of new equipment as an incentive for improving future tariff structures.	MEC
Economic and Project Management Risks			
11. MEC has no internal audit function. Very difficult to recruit skilled internal auditors. Constraint on verification of use of project resources.	S	ADB TA consultant support will be provided to monitor and report on use of project resources; scope of review and recommendations by consultants under Output 2 of project will include financial management.	ADB, Supervising consultants
12. Tailor-made AMI center software solutions or unnecessary large software packages offered at above acceptable price.	M	Tenderers will be requested to provide simple data-collecting software instead of standard industry billing software.	Supervising consultants
13. Insufficiently large order to entice major international suppliers of AMI equipment.	L	Smaller suppliers will be invited and considered during tender process. Alternative measurement equipment (non-revenue meter grade, but standard industry metering equipment) will be accepted under tender.	Supervising consultants

14. Supplier of equipment (tenderer) could offer data-ownership-and-sale model only, under which they retain all produced data and sell it to MEC on monthly basis.	L	Online, cloud-only data storage services and metering data ownership by third parties will not be accepted.	Supervising consultants
15. Lack of ongoing support for the AMI Center and AMI equipment leading to eventual failure of the system	L	MEC to incorporate AMI into its asset base, establish proper maintenance routines and on-site or remote maintenance from the supplier.	MEC
Integrity Risk			
16. Risk of fraud or corruption within EA	L	Integrity due diligence completed on EA management and directors; no integrity risks identified.	ADB
Overall	Low	(All risks are reduced to LOW after mitigation measures)	

MEC – Marshalls Energy Company, AMI – Advanced Metering Infrastructure, 4G – 4th generation telecom network, PMU – Project Management Unit, NTA – National Telecom Agency.

Risk Legend: L = Low; M = Moderate; S = Substantial