MINISTRY FOR THE ENVIRONMENT, ENERGY AND ENTERPRISE (MEEE)

Republic of Malta

National Risk Preparedness Plan 2022 – Electricity Sector

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GLOSSARY OF TERMS

Acronym	Term
DSO	Distribution System Operator
ENTSO-E	European Network for Transmission System Operators for Electricity
ERA	Environmental and Resources Agency
CPD	Civil Protection Department
FSU	Floating Storage Unit
LNG	Liquefied Natural Gas
MEEE	Ministry for the Environment, Energy and Enterprise
MHSR	Ministry for Home Affairs, Security, Reforms and Equality
MIS	Major Incident Scenario
NCS	National Crisis Scenario
NDCA	National Designated Competent Authority [Energy]
NRA	National Risk Assessment [Report, Malta]
OHSA	Occupational Health and Safety Authority
NRPP-ES	National Risk Preparedness Plan – Electricity Sector
RCS	Regional Crisis Scenario
REWS	Regulator for Energy and Water Services
RPR	Risk Preparedness Regulation (EU) 2019/941
TERNA	TERNA S.p.A. – Rete Elettrica Nazionale

Normative References

1. National Risk Assessment, 2016. (MHSR)
2. Identification of National Electricity Crisis Scenarios for the Republic of Malta.

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1.0 INTRODUCTION AND CONTEXT

1.1 In common with other European countries Malta's electricity supply is vulnerable to risks, hazards and threats, whether naturally occurring or human-induced. Cyber-attacks, extreme weather, physical attacks or natural phenomena all carry a risk potential to impact upon the country's electricity supply in a first instance, with concomitant effects and consequences.

1.1 As an Island on the periphery of the trans-European electricity network and physically isolated from the trans-European gas network, Malta's energy supply relies on generation from land-based installations [power stations] and a subsea connector with Sicily [the interconnector]. This effectively means that supply of electricity is intrinsically vulnerable to losses of any single asset (*N-1*).

1.2 In contrast with Northern Europe, peak electricity demand in Malta typically occurs in the summer months, due to significantly increased demand for air conditioning and cooling exacerbated by the influx of tourists during the hot season. Whilst average supply from solar PV also increases, the available capacity of dispatchable supplies (thermal plant and the sub-sea connector) decreases marginally due to high ambient temperatures. Therefore, there is a direct correlation between pronounced seasonal variations affecting both the impact and likelihoods of an energy crisis (therefore the risk) and several Major Incident Scenarios [MIS] identified in the National Risk Assessment [NRA] and beyond.

1.4 The electricity system operator, Enemalta plc, was assigned the responsibility of preparing this report on behalf of the ministry responsible for energy. This report has been prepared pursuant to Article 10 of *Regulation (EU) 2019/941 on Risk Preparedness in the Electricity Sector*. Member States are required to establish risk-preparedness plans on the basis of the identified regional and national electricity crisis scenarios. This report is Malta's first Electricity's Risk Preparedness Plan.

2.0 REPORT OBJECTIVES

2.1 *The National Risk-Preparedness Plan: Electricity Sector* [NRPP-ES] report carries the following objectives:

- To document the national position relating to Risk Preparedness in the event of a crisis in the electricity sector, as mandated by the RPR
- To create the National Framework for risk-preparedness in the electricity sector, capable of meeting the demands of a crisis-level Major Incident Scenario and other foreseeable scenarios
- To align the NRPP-ES with the National Risk Assessment [NRA], developed by the *Ministry for Home Affairs, Security, Reforms and Equality* (MHSR) in conjunction with the CPD.
- To establish the essential minimum criteria for resilience, business continuity and risk management required from National stakeholders.

3.0 SUMMARY OF ELECTRICITY CRISIS SCENARIOS

3.1 Regional Crisis Scenarios [RCSs]

3.1.1 Regional Crisis Scenarios [RCSs] are an important element for identifying and articulating the precise scope for cross-border cooperation and assistance in the event of such crises. RCSs also

provide the basis for identifying National Crisis Scenarios [NCSs] which could potentially result from regional risk events or major incident scenarios.

3.1.2 In appraising the regional scenarios as outlined by *European Network of Transmission System Operators for Electricity* [ENTSO-E], it has been appropriate to consider one additional scenario related to the sub-sea connector with Sicily (Scenario Ref Id: 32) which has direct relevance for Malta.

3.1.3 The Regional Crisis Scenario analysis applied the same principles as the ENTSO-E methodology. A summary of this analysis (for Malta as based on the ENTSO-E Regional Scenarios report) is contained in Figure 1 at the end of this section.

3.2 National Crisis Scenarios [NCSs]

3.2.1 In accordance with Article 7(1) and (3) of the Regulation, the National Crisis Scenarios [NCSs] are already described in the report: *Identification of National Electricity Crisis Scenarios for the Republic of Malta*. For the purposes of the ERPP-ES, the NCSs described in detail in the Appendix to the report, have been consolidated and rationalised, on the basis of the following risk criteria:

- Type of initiating event
- The nature of the scenarios
- The planned preparedness, response, risk mitigation and resilience measures and capabilities active at the time of the incident.

3.2.2 Qualitative descriptions of potential crisis scenarios allow for broader scope in risk analysis, resulting in deeper insights with which to inform operational risk management. In turn various stakeholders are able to determine the most suitable risk control measures relating to:

- Hazard identification and risk prevention
- Emergency preparedness, response and crisis management
- Risk mitigation through business continuity, operational risk management and resilience.

3.2.3 The NCSs necessarily align with pre-established crisis scenarios identified for Malta's critical national infrastructure [CNI] within the *National Risk Assessment* [NRA], developed by the *Ministry for Home Affairs, Security, Reforms and Equality* (MHSR).

3.2.4 By grouping the Regional Crisis Scenarios [RCS] within the National Crisis Scenarios [NCS], the method adopted enhances context and stakeholders shall be better able to analyse and account for risk factors in a suitable and systematic manner. Risk factors may include:

- Specific aspects relating to seasonality
- Forecasts of demand and supply
- Physical location of impacted assets
- Market conditions
- Environmental factors
- Other factors.

Note: The NCSs and RCSs are consolidated in the Table 1 below and aligned with the Major Incident Scenarios [MIS] identified and analysed within the NRA.

3.3 Methodology

3.3.1 Table 1 summarises the eight NCSs and RCS groupings. Ratings for the consolidated crisis scenarios – the National Electricity Crisis Scenarios [NECSs] - apply the established ACER / ENTSO-E methodology.

3.3.2. The impact rating scale ranges from (1) *Insignificant* to (5) *Disastrous*.

3.3.3. The likelihood rating scale runs from (1) *Very Unlikely* (event expected to occur less than once every 100 yrs.) to (5) *Very Likely*, where the crisis event is foreseeable in, at least, one instance every two years, or more frequently.

3.3.4. The cross-border risk factor [X-BDRrf] for the consolidated risk scenarios are rated as follows:

- X-BDRrf =1.0: No X-border impact anticipated,
- X-BDRrf >1.2: X-Border risk exacerbating factors are foreseeable
- X-BDRrf >2.0: A high degree of X-Border interdependency or risk correlations exist.

RCSs were each assigned an ID-number between 01 and 32, and grouped under the relevant NECS. This method allows for application of an aggregated assessment of impact, likelihood, and cross border effect, to determine an indicative priority rating for each national electricity crisis scenario, as shown in Table 1 below. NECS risk analysis and ratings shall be utilised as the basis for informing the National Energy Emergency Test Programme [NEETP] and prioritising the scope and specific objectives for individual Emergency Test Plans [ETPs].

Ser	NECS	ID: Regional Crisis Scenarios	Aggregated Risk Assessment			
			Impact	Likelihood	X-BDR_{rf}	Risk Rating
01	Cyber-attack	01,02	4.00	5.00	1.2	24.0
02	Extreme weather	07,09,10,11,12,16,28, 29	3.60	3.60	1.2	15.6
03	Physical attack	03,04,05,06	3.75	3.75	1.1	15.5
04	Human-related	20,23,24,26,32*	3.50	3.75	1.1	14.4
05	Fuel shortage	13,14	3.00	3.00	1.2	10.8
06	Technical failure	15,17,18,19,22	2.50	3.00	1.1	8.3
07	Market rules	21,25	2.00	3.00	1.2	7.2
08	Natural disasters	08,27,30,31	2.35	2.35	1.2	6.6

Table 1 - NCS Aggregated Risk Assessments

3.4 Cyber-Attack [RCS: 1, 2]

3.4.1 Description of National Scenario:

Cyber-attack on business-critical ICT infrastructure of entities which are physically connected to the power grid, directly impacting:

- Distribution System Operator (DSO) and distribution network
- LNG FSU and/or interconnected facilities
- Power plants
- Major (industrial) loads
- Major end users and/or market participants.

A cyber-attack on any of the above-listed asset-types would very likely lead to the temporary loss of control over the gas/generation/distribution control systems (or facilities), with possible escalation triggering grid instability.

3.4.2 Working Assumptions:

- A short duration crisis event directed at or impacting upon certain specific generation assets can be mitigated using local control of systems and manual override to bypass corrupted systems by utilising operational resources
- If the impact is longer term or affecting multiple assets or gas / electricity facilities where local control is not possible, then the potential outcome would be significant
- Various systems could be potentially disrupted including distributed control systems, communications, and individual automated control processes
- Based on publicly available reports on cyber-attacks targeting energy infrastructure globally, a significant attack attempt is reasonably expected once every 18 months, i.e., highly likely
- Power generation and gas facility assets are designated as critical infrastructure
- The Computer Security Incident Response Teams (CSIRT) within designated operators are supported by a National CSIRT unit
- Loss of largest single unit - the Gas Facilities - impacts approximately 274MW.

3.5 Extreme Weather [RCS: 7,9,10,11,12,16,28,29]

3.5.1 Description of National Scenario:

- Damage to individual generation assets, gas infrastructure, components of distribution network, or multiple failures caused by natural extreme weather, e.g., heavy precipitation and flooding; heatwave and dry spell. Space weather, such as solar storms, are treated in similar way, as specific components or facilities being adversely impacted would be comparable.

3.5.2 Working Assumptions:

- Impact will be limited when affected equipment tripping power can be restored in less than 24 hours. The effect to grid supply capability depends on which specific infrastructure/equipment is damaged.
- Most infrastructure/equipment is redundant, so unless both main and redundant are damaged, then normal recovery is assumed possible
- The scenarios assume redundancy is effective and realistic, that the secondary asset can be introduced without unreasonable delay and that critical spares are available at short notice.

3.6 Physical Attack [RCS: 3,4,5,6]

3.6.1 Description of National Scenario:

Physical attack on critical assets, or sabotage by key employees, or an infiltrating third party utilising force to destabilise system or critical assets including:

- Power plants
- The 132kV and 33kV distribution network
- The LNG/gas infrastructure
- The sub-sea connector to Sicily
- Control Rooms.

Potential high impact signifies operator(s) no longer in full control, a high Expected Energy Non-Served [EENS] (GWh/year) and Loss of Load Expectation LOLE (h/year) given that repairs may take long, depending on extent of damage. The infrastructures are generally exposed to high degrees of vulnerability due to single principal access route to multiple assets co-located on site.

3.6.2 Working Assumptions:

- Missing electrical capacity will be automatically drawn from alternative sources in the short-term while rolling black-out would need to be introduced to avoid long-term damage to key assets
- Mitigation in part requires generation assets to respond to manual interference.

3.7 Human-Induced Threat Scenarios [RCS: 20,23,24,26, 32*]

3.7.1 Description of National Scenario:

N-2 scenario – human error directly causing exceedance of N-1 criterion:

- Strikes;
- Riots or industrial action in the supply chain;
- Large impact resulting from industrial accident;
- Significant damage to the sub-sea connector to Sicily or related ancillaries;
- Significant forecast errors for renewables.

A common factor is human error – e.g., a network Distribution Centre trip resulting in the unintended disconnection of an individual power plant or the Italy-Malta sub-sea connector.

3.7.2 Working Assumptions:

- Out-of-market reserves initiated, or sub-sea connector and other plants (still running) may be enough to cover demand, assumes low likelihood of error occurring at peak demand.
- Potential cross border impact within common synchronised grid area resulting from frequency and voltage disruption, and rapid adverse swing in load flows.

3.8 Fuel Shortages [RCS: 13,14]

3.8.1 Description of National Scenario:

- Shortage / supply disruption of LNG (Liquified Natural Gas), gasoil or natural gas. Malta's dispatchable generation capacity is dependent on natural gas derived from LNG supplies, the Floating Storage Unit (FSU) and generators that utilise land-based gasoil storage. (Note: Malta has no direct dependency on nuclear fuel).

3.8.2 Working Assumptions:

- In the event of concurrent disruption to both gasoil and LNG supplies, Malta's electricity supply would rely entirely on the sub-sea connector with Sicily, with some demand offset by land-based PV.
- Consequently, there would be an enhanced cross-border (regional) dependency for electricity to meet absolute demand and to provide ancillary / balancing services.
- The duration of impact would be minimised if LNG/gasoil cargos are diverted to Malta.

3.9 Technical Failure [RCS: 15,17,18,19,22]

3.9.1 Description of National Scenario:

A local technical failure or complexity of control systems (including near or real time loss of system operations ICT / communications) leading to potential simultaneous failure of power system primary elements, serial equipment failure.

3.9.2 Working Assumptions:

- Technical failure is assumed to result in national impact, requiring that strategic (out-of-market) land-based emergency reserves shall essentially need to be synchronised and dispatched.
- Likelihood of technical failure in common generation and/or distribution network components within the Italian grid simultaneously triggering capacity reduction in Malta is rated low risk.

3.10 Market Rules [RCS: 21,25]

3.10.1 Description of National Scenario:

Unexpected / unforeseen interaction of energy market rules are not directly applicable for Malta due to lack of a wholesale electricity market. Other than the financial impact, the physical impact is considered as an extension to unwanted or unscheduled power flows.

3.10.2 Working Assumptions:

Due to the island nature of Malta's grid configuration, limited connection to European power markets and the absence of a wholesale energy market, there would be minimal impact of unexpected interaction of market rules and unscheduled power flows.

3.11 Natural Disasters [RCS: 8,27,30,31]

3.11.1 Description of national scenario:

Including volcanic eruption (in nearby Sicily), an earthquake, or an infectious disease spreading in an epidemic or pandemic manner. Earthquake could result in damage to part of generation assets and damage cable routes, tunnels or other electrical distribution infrastructure, disrupting the operation of the 132kV/33kV network.

3.11.2 Working Assumptions:

132kV / 33kV network is laid below ground so has limited vulnerability to volcanic ash. It is expected that any impacted components can be repaired or replaced from available stores and supplies.

RISK SCENARIO		IMPACT		LIKELIHOOD				
		EENS%	LOLE					
		Unserved Energy	Outage Duration	Very Likely	Likely	Possible	Unlikely	Very Unlikely
1.	Cyber Attack – Generation ICS/SCADA or on DSO direct	Disaster	Critical	Disaster	Disaster	Critical	Major	Minor
2.	Physical Attack – Critical Infrastructure [Incl.3]	Disaster	Critical	Disaster	Disaster	Critical	Major	Minor
3.	Physical Attack – Control Centres [See 2]							
4.	Kidnap of a Key Employees [See 5]							
5.	Insider Attack [Incl.4]	Major	Critical	Disaster	Critical	Major	Minor	Minor
6.	Solar Storm	Disaster	Disaster	Disaster	Disaster	Critical	Major	Minor
7.	Volcanic Eruption	Disaster	Disaster	Disaster	Disaster	Critical	Major	Minor
8.	Seasonal Storms [See 15]	Disaster	Critical	Disaster	Critical	Critical	Major	Minor
9.	Cold Spell [See 15]	Disaster	Dissater	Disaster	Critical	Critical	Major	Minor
10.	Heavy Precipitation / Floods	Disaster	Major	Disaster	Critical	Major	Major	Minor
11.	Harsh Winter Weather	Disaster	Disaster	Disaster	Critical	Major	Major	Minor
12.	Fossil Fuel Shortage	Disaster	Minor	Disaster	Critical	Major	Major	Minor
13.	Technical Failure (Malta) [See 18]	Disaster	Insig	Disaster	Critical		Major	Minor
14.	Extreme Weather causing multiple failures [8,9,10,11]	Disaster	Dissater	Disaster	Critical		Major	Minor
15.	ICT failure [Includes internal comms]	Disaster	Critical	Disaster			Major	Minor
16.	Simultaneous loss of a Critical Infrastructure [N-2]	Critical	Major				Minor	Minor
17.	Complexity of ICS [Incl. 13]	Critical	Critical	Critical	Critical		Minor	Minor
18.	Human induced failures – Accidental / Error [N-1 N-2]	Critical	Minor	Critical				Minor
19.	Undesired power flows [Incl.23]	Critical	Critical	Critical	Major	Major	Minor	Minor
20.	Serial equipment failure	Critical	Insig	Critical	Major		Minor	Minor
21.	Industrial action – Strikes; Rioting	Critical	Critical	Critical	Major		Minor	Ins
22.	Industrial accident on a Large Scale	Major	Major	Critical				Ins
23.	Energy market rules conflict [See 19]	Major	Minor	Major			Minor	Ins
24.	High error solar PV forecasts	Minor	Major	Major	Major	Minor	Minor	Ins
25.	Pandemic	Major	Insig	Major	Major	Minor	Minor	Ins
26.	Heatwave [Incl. 27]	Insig	Major	Major				
27.	Dry spell [See 26]	Minor	Minor	Major				
28.	Earthquake	Minor	Insig	Major	Minor	Minor		
29.	Forest fires	Insig	Minor	Major	Minor	Minor	Ins	Ins
30.	Damage to Interconnector / Sicilian Grid	Ins	Ins	Minor	Minor	Ins	Ins	Ins

National Risk Assessment

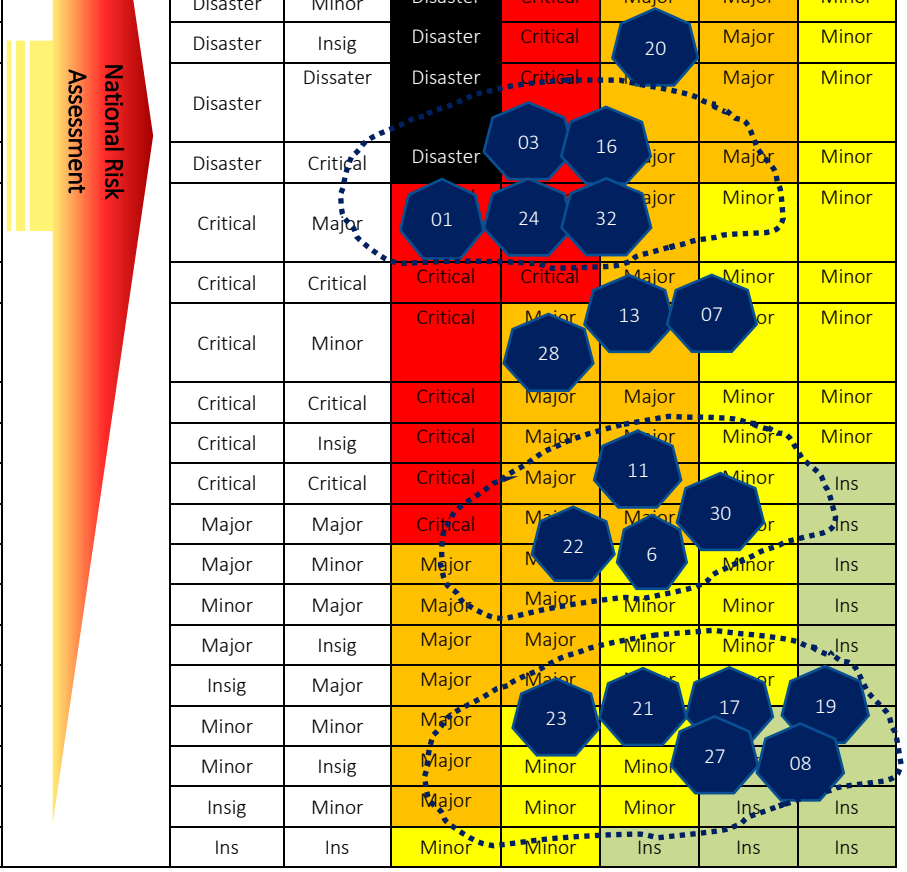

Figure 1 – Malta: Regional Crisis Scenarios and Risk Matrix

4.0 CRISIS MANAGEMENT ROLES AND RESPONSIBILITIES

The structure, functions, roles and responsibilities relevant to the preparation and implementation of NRPP-ES are defined in this section.

4.1 The National Designated Competent Authority [NDCA]

4.1.1 The MEEE (the Ministry), as the ministry responsible for energy, is the National Designated Competent Authority [NDCA], designated in accordance with Article 3 of the RPR and is responsible for the following activities at strategic level:

- Providing the Electricity Coordination Group and the Commission with an ex-post evaluation report within three months after the end of an electricity or gas crisis.
- Collating and analysing all relevant information from relevant energy facility operators and other affected parties during and following an emergency disruption of energy supply.
- Organising electricity and gas supply crisis simulations in cooperation with the distribution system operator and other relevant stakeholders. (Note: The responsibility for implementing simulations may be delegated to other relevant stakeholders within the energy sphere of interest).
- Updating national gas and electricity supply crisis scenarios at least every four years in line with the *Gas Security of Supply and Electricity Risk Preparedness Regulations*, respectively. The task of updating these scenarios can be delegated to other relevant stakeholders within the Ministry.
- Ensuring timely communication between the Government bodies and external parties in a crisis situation with the assistance of relevant stakeholders within the Ministry and the operators.

4.1.2 The NDCA is designated as the Competent Authority responsible for both the NRPP-ES and Gas Security of Supply .

4.1.3 Within the NDCA, the Permanent Secretary, MEEE, holds the overall responsibility for acting as the focal point in oversight over all aspects of the NRPP-ES, including:

- Policy
- Preparedness
- Risk and Crisis Management.

4.1.3 As the designated focal point within the NDCA, the Permanent Secretary, MEEE shall be designated the role *Energy Crisis Coordinator* during emergency disruptions of both electricity or gas supply, and is responsible for issuing early warning and the declaration of crisis levels. The role of the Energy Crisis Coordinator is defined in Section 6.

4.2 Responsibilities Delegated to Related Parties

4.2.1 National Regulatory Authority [NRA] – Regulator for Energy and Water Services (REWS).

As the designated NRA, REWS is responsible for ensuring:

- The collection of data and submission of periodic reports on the energy security of supply situation to the Energy Crisis Coordinator and the NDCA.

- The availability of accurate and timely information is necessary to enable the NECC and NDCA to assess the situation and relevant risk factors and to select the appropriate crisis levels in line with the escalation (and de-escalation) criteria outlined in Section 3 of the ESRPP.
- Correct and timely information that will assist the Energy Crisis Coordinator and NDCA in taking the necessary informed decisions to mitigate the electricity crisis.

4.2.2 Energy and Water Agency (EWA)

- EWA is a Government Agency established by promulgation of L.N. 340/2016, operating within the ministry responsible for energy.
- EWA formulates and implements national policies in the energy and water sectors, addressing security, sustainability and affordability of energy and water in Malta.
- EWA provides the technical resources that support the ministry responsible for energy.
- Upon request by the Ministry, the Agency provides technical and policy support in the assessment of the energy security of supply situation, both during business-as-usual as well as in crisis situations.

4.2.3 Distribution System Operator – Enemalta plc

Under the terms of its operating licence granted by the NDCA, the Distribution System Operator, (Enemalta plc), is responsible for:

- Developing and implementing co-ordinated Delimara site emergency response plans and response arrangements.
- Operating and restoring the electricity system in case of an electricity crisis
- Ensuring the enforcement of a formalised process for electricity grid disconnections to protect vulnerable groups of consumers, in particular in the event of an emergency.
- Carrying out regular maintenance of its emergency generation and distribution assets
- Ensuring that the gas and other electricity facility operators carry out regular maintenance of their assets
- Dispatching of electricity from land-based generation plants and the electricity sub-sea connector with Sicily, based on their order of economic merit, technical capacity and existing contractual arrangements.
- Ensuring the availability of alternative back-up gasoil-fired generation as required, including appropriate fuel stock.
- Implementing non-market-based measures in the event of an emergency, if required.
- Providing complete and timely information to REWS.
- Informing stakeholders and notifying all customers of any matter that causes danger or requires urgent attention in relation to the supply of electricity. (Note: The provision of information includes short- and long-term electricity demand forecasts, monitoring, and forecasting natural gas use, LNG stock levels and deliveries, and the availability of electricity supply capacity).

4.2.4 Gas and Electricity Facility Operations

- The respective gas and electricity facility operators are individually responsible for operational crisis management and shall be capable of acting independently in the first instance in responding to an operational incident (e.g. fire), before the emergency escalates into a crisis.

- Electricity generators are responsible for maximising electricity supply and optimising plant availability and flexibility in an emergency, if directed.

A significant proportion of electricity generation is sourced from imported LNG together with its ancillary gas facility. Accordingly, the gas facility operator shall also be responsible for optimising the availability of natural gas in crisis scenarios, if directed, and co-ordinating and enforcing gas facility emergency response arrangements.

4.2.5 Malta Critical Infrastructure Protection Directorate (CIPD).

- The Government has established the Malta CIPD within the Ministry for Home Affairs, Security, Reforms and Equality to coordinate all Critical Infrastructure Protection issues on a national level.
- The CIPD coordinates stakeholders involved in managing:
  i. Critical Infrastructures (CI),
  ii. Critical Information Infrastructures (CII),
  iii. Operators of Essential Services,
  iv. Digital Service Providers incorporating owners, operators, entities, departments, and other related bodies.
- Malta CIPD also provides early warnings/alerts and advice via its Computer Security Incident Response Team (CSIRT) concerning cyber threats and incidents, to operators of critical infrastructure, critical information infrastructure (including critical/essential entities within the energy sector) and to other sectors.

4.2.6 Civil Protection Department (CPD)

- Article 3 of the Civil Protection Act[i] establishes that the CPD is responsible for providing first response during emergency situations. This includes providing first response should there be an emergency at the gas or electricity facilities.
- The CPD is also responsible for the establishment of the infrastructural set-up required to ensure co-ordination between departments of Government, local councils and non-governmental organisations which can be called upon to respond in a national or regional disaster or in an emergency, including an electricity / gas supply crisis.
- In crisis situations CPD will liaise with the other emergency and security services (including the Police and AFM), emergency health services, other organisations involved in national emergency and disaster management, and the Government Contingency Centre. (Note: The Malta Police Force is responsible for ensuring internal security and preserving public order and peace).

4.2.7 Civil Protection Council

- Article 5 of the Civil Protection Act establishes the Civil Protection Council, an official body appointed by the Prime Minister. The Act allows for a representative member to be appointed onto the Council specifically to perform duties related to fuel and energy matters. At present, duties relating to fuel and energy affairs remain directly the responsibility of the NDCA.
- The function of the Council includes the formulation, direction and co-ordination of all national policy issues and practices related to civil protection. If a crisis level is triggered by the Energy Crisis Coordinator in the event of disruption to electricity or gas supply, the

Energy Crisis Coordinator will co-ordinate with the Civil Protection Department to ensure coherence and flow of information in responding to the crisis.

4.2.8 The President of Malta

The Emergency Powers Act[ii] assigns legal responsibility upon the President of Malta, in accordance with the advice of the Prime Minister, and if satisfied that a public emergency exists, to make regulations which are necessary or expedient for securing public safety and maintaining supplies and services. In a public emergency, this legal provision effectively places authority over the allocation and utilisation of electricity and gas resources with the President.

5.0 LEGAL FRAMEWORK, PROCEDURES AND MEASURES IMPLEMENTED IN AN ELECTRICITY CRISIS

5.1 National Procedures and Measures

5.1.1 National Legislation.

The procedures implemented in an electricity crisis are governed by Maltese National Legislation. A summary of Maltese legislation includes:

- Emergency Powers Act
- The Civil Protection Act [iii]
- Legal Notices 434 of 2011 on CIP and 216 of 2018 on NIS
- The Enemalta Act[iv]

5.1.2 European Regulations.

A European regulatory framework provides for risk management during an energy crises at all levels: strategic; tactical and operational. The following European regulations are (all) relevant to the ERRP:

- (EC/Reg) 2017/1485 establishing a guideline on electricity transmission system operation[v]
- (EC/Reg) 2017/1938 concerning measures to safeguard the security of gas supply[vi]
- (EC/Reg) 2017/2196 establishing a network code on electricity emergency and restoration[vii]
- (EU/Reg) 2019/943 concerning the internal market for electricity[viii]
- (EU/Reg) Regulation (EU) 2019/941 on risk preparedness in the electricity sector[ix]
- (EC/Reg) Council Directives 114/2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection[x]
- (EU/Reg) 2019/941 of the European Parliament and of the Council of 5 June 2019 on risk-preparedness in the electricity sector and repealing Directive 2005/89/EC[xi].

5.1.3 Declaration of Crisis Level.

Legal responsibility for declaring an energy crisis in Malta, (as well as subsequent crisis levels), is vested in the NECC. Designated by the ministry responsible for energy as the National Competent Authority, the NECC is the Permanent Secretary.

5.1.4 Routine Monitoring.

During "business-as-usual", the National Regulatory Authority [NRA], as Regulator for Energy and Water Services (REWS), assesses the likelihood of specific events causing a deterioration of electricity or gas supply. Utilising horizon-scanning techniques, the following criteria are factored into the risk evaluation processes:

- Market information
- Plant performance
- Forecast of supply
- Demand data
- Other factors

Specific criteria are applied to determine the crisis level prior to making a formal Crisis Declaration. In accordance with Regulation 2017/1938 (concerning gas security of supply) three crisis levels: are defined

- Level 1: Early Warning – whereby the NCC provides early notification to interested parties of risk conditions in the electricity and gas supply sector, which carry realistic potential to escalate into an emergency situation
- Level 2: Alert - whereby the NCC provides ongoing information to interested parties of elevated risk conditions in the electricity and gas supply sector, which carry realistic potential to escalate into an emergency situation within a foreseeable timeframe
- Level 3: Emergency - whereby the NCC declares an energy crisis.

Technical Note: *Specifically for electricity, the Regulation (Art. 14) obliges a Member State to declare either early warning (based on a seasonal adequacy assessment) or an electricity crisis. As gas and electricity supply emergencies in Malta are interlinked, the ERRP applies the three levels as set out in the gas security arrangements, based on a working assumption that an electricity crisis would essentially impact directly on the gas security of supply, simultaneously creating both "alert" and "emergency" levels.*

5.1.5 Emergency Response.

- In the event that a major incident or a sudden onset of an energy crisis would require the provision of immediate emergency response resources, the Civil Protection Department (CPD) shall be notified, briefed in full regarding the situation and mobilised. The CPD shall establish the necessary infrastructure and communications to ensure co-ordination between Enemalta, in its capacity as the DSO, the energy supply facilities operators, Government departments, local councils, and non-governmental organisations.
- The NCC shall liaise and coordinate with the CPD to determine what further steps may become necessary including, at an Emergency Crisis level, whether to seek invocation of the Emergency Powers Act.
- National procedures are supported by Enemalta Standard Operating Procedures (SoP) and ancillary policies, pland, procedures, processes and working practices. Exemplars include the *Emergency Response and Security Plan*, relevant *Safety, Environmental and Security procedures*, the *High voltage Network Emergency Plan* and the relevant processes for *Restoration of Supply after Total Shutdown*.

5.1.6 Government Ministries Responsibilities.

The main Government ministries and organisations in Malta with specific responsibility in an energy supply crisis event fall under the ministry responsible for energy and the ministry responsible for home affairs. The relevant bodies and agencies falling within the remit of these ministries, as well as other Government ministries, follow:

- Ministry responsible for energy: Enemalta plc (the Distribution System Operator), Energy & Water Agency (EWA), Water Services Corporation (WSC), Regulator for Energy & Water Services (REWS).
- Ministry responsible for home affairs: Police, Civil Protection Department (CPD), Critical Infrastructure Protection Directorate (CIPD).
- Ministry responsible for transport: Ports & Yachting Directorate, Marine Enforcement Directorate, Land Transport Directorate, Civil Aviation Directorate.
- Ministry responsible for foreign affairs.
- Ministry Responsible for EU affairs.

5.1.7 Information Flow in an Energy Crisis

- Accurate information flow and timely communication is integral to minimising harm in a crisis event and that there can be a quick and enduring recovery from an energy supply crisis.
- In a crisis event, the Energy Crisis Coordinator shall facilitate the exchange of energy related information between the relevant parties. These parties include, but are not necessarily limited to:
-
  i. CPD,
  ii. REWS,
  iii. Enemalta,
  iv. TERNA (the Italian electricity transmission grid operator),
  v. Gas and electricity facility operators,
  vi. The ministries responsible for health, water and drainage, environment, and transport,
  vii. Operators of protected sites (see section 3.4).

- Information shall include expected gas and electricity facilities return-to-service, availability of damaged components or systems, forecast energy demand information, existing plant and sub-sea connector capacity, emissions against environmental constraints and details of any potential aggravating factors.
- Information shall also include options such as potential demand reduction available from alternative load shedding regimes. Load shedding is in response to decreasing frequency (automatic) or controlled (manual).
- The indicative flow of information prior to, during and post crisis event is demonstrated in Fig. 3 below.

Figure 2 - Information Flow during a Crisis

5.1.8 Crisis Levels.

- Malta implements a single hierarchy and description method for all energy supply crisis levels, ranging from No Crisis (business-as-usual), across to Early Warning [Level 1], escalating into Alert [Level 2] and an Emergency [Level 3]. The hierarchy is articulated in *Table 2 – Criteria for Setting Crisis Levels.*
- Crisis levels and the associated indicators and decision parameters are applied equally to all electricity, gas and other energy supply-related crisis events. Given the interlinkages between gas and electricity in Malta, a unified approach is applied whereby crisis levels reflect both the Gas Security of Supply and Electricity Risk Preparedness Regulations.

- REWS monitor key indicator data and identify whether crisis escalation or de-escalation criteria indicate the need to declare a crisis level or action an early warning. Escalation /de-escalation triggers are shown in Table 3 - Specific Emergency Measures. (Note: In certain events a crisis may be notified directly to Alert or Emergency Levels).

Crisis Level	*Description*	*Indicators*	*Decision Parameters*
No Crisis BAU	• *Business as usual. Supply, demand, storage of gas-oil and LNG within acceptable / tolerable range and sub-sea electrical connector available.*	• *No changes outside tolerance to LNG supply, forecast LNG stock, electricity supply capacity, forecast electricity demand or sub-sea connector capacity/availability.*	• *Adverse change to planned LNG deliveries or stocks, or to generation plant / sub-sea connector availability or capabilities.*
Early Warning [Level 1]	• *Concrete, serious, and reliable information that an event which is likely to result in significant deterioration of ability to supply electricity e.g., ability to supply gas or distribute electricity, may occur and is likely to lead to the alert or the emergency level being triggered.*	• *A likelihood of potential disruption to future supplies of LNG or for demand for gas. Short term tripping of distribution safety features. Cyber threat level increased.*	• *Requirement for alternative market-based measures from usual business practices to re-dress the potential disruption of electricity supply to meet forecast demand.*
Alert [Level 2]	• *Disruption of gas supply or exceptionally high gas or electricity demand which results in significant deterioration of the gas or electricity supply situation occurs, but the market is still able to manage that disruption or demand without the need to resort to non-market-based measures.*	• *Likely specific disruption to LNG supplies, LNG stocks, electricity interconnector, gas-oil generation or PV available capacity, or an increase forecast demand for electricity. Repeated unresolved electrical distribution faults. Cyber-attack deemed likely.*	• *Urgent requirement for alternative market-based measures to re-dress the potential disruption of gas and electricity supplies to meet forecast demand.*
Emergency [Level 3]	• *High or exceptionally high energy demand, significant disruption to supply or other significant deterioration of the supply situation. All relevant market-based measures have been implemented but supply is insufficient to meet demand. All available non-market-based measures must be introduced to safeguard supplies to protected customers. Inability to supply electricity to meet demand in several locations*	• *Actual disruption (physical and/or cyber) to electricity sources, natural gas production, LNG supply, electricity supply, grid stability or restrictions on system / control and dispatch capability. Significant electricity supply interruption.*	• *Are market-based measures sufficient? Are non-market-based measures required?* • *Start limiting electricity supplies to priority customers only.* • *What co-operation and support from other Member States to be requested?*

Table 2 – Criteria for Setting Crisis Levels

Crisis Level	*Escalation Criteria*	*De-Escalation Criteria*	*ACTION* *(additional per level)*
No Crisis ***[BAU]***			*Business as Usual:* *Grid frequency and voltage within normal operational tolerances* *Monitor forecast and actual electricity demand and gas use rates* *Monitor FSU stock levels and LNG forecast deliveries* *Monitor forecast and actual capacity of land-based generation and the sub-sea Sicily-Malta connector*
Early Warning ***[Level 1]***	*Indicators of 132 or 33kV grid instability* ***OR*** *With current LNG in FSU and forecast rate of use, would forecast stock drop below Op MIN before next planned delivery? if yes, Early Warning.* ***OR*** *Is there serious potential for withdrawal of available interconnector or land-based generation capacity? If yes, Early warning.* ***OR*** *Will forecast demand for gas generation cause LNG in FSU to fall below Operational Minimum before next delivery due? If yes, Early Warning.*	*Is 132 and 33kV grid stable and in tolerance?* ***AND*** *With current LNG in FSU and forecast rate of use, would forecast stock drop below Op MIN before next planned delivery? If no, No Crisis.* ***AND*** *Is there serious potential for withdrawal of available interconnector or land-based generation capacity? If no, No Crisis.* ***AND*** *Will forecast demand for gas generation cause LNG in FSU to fall below Operational Minimum before next delivery due? If no, No Crisis.*	*Seek to monitor likelihood of significant deterioration to Alert or Emergency levels:* *Gas facility op monitor availability of interim/top up delivery* *Validate interconnector availability* *Validate spare part available for LNG transfers (N+1 capability on LNG transfer equip)* *Explore possibility of bringing forward next LNG delivery*
Alert ***[Level 2]***	*Are significant parts of the 132kV network operating with imminent risk of tripping and prolonged recovery time?* ***OR*** *With current LNG in FSU and forecast rate of use, would forecast stock drop below Op MIN in the next 5-15 days? if yes, Alert.* ***OR*** *Is gas facility operational on restricted (<50%) availability? If yes, Alert.* ***OR*** *Is interconnector or land-based generation restricted, (<50%)? If yes, Alert.*	*Is 132kV Grid operating normally?* ***AND*** *With current LNG in FSU and forecast rate of use, would forecast stock drop below Op MIN in the next 5-15 days? If no, Early Warning.* ***AND*** *Is gas facility operational on restricted (<50%) availability? If no, Early Warning.* ***AND*** *Is interconnector or land-based generation availability restricted, (<50%). If no, Early Warning.*	*Continue recommended actions for Early Warning.* *Seek to resolve with market-based measures:* *Bring next delivery forward within existing commercial arrangements*

Crisis Level	*Escalation Criteria*	*De-Escalation Criteria*	*ACTION* *(additional per level)*
	Is there a significant and prolonged failure in capacity of 132kV network resulting in forced and prolonged grid disconnections? ***OR*** *With current LNG in FSU and forecast rate of use, would forecast stock drop below Op MIN within the next 5 days? if yes, Emergency. If no, Alert.* ***OR*** *Is gas facility operational? If no, Emergency.* ***OR*** *Is land-based generation available? If no, Emergency.* ***OR*** *Prolonged unavailability of the interconnector? If yes, Emergency.*	*Is 132kV and 33kV available network capacity sufficient to meet all forecast demand for next 24-48hrs?* ***AND*** *With current LNG in FSU and forecast rate of use (electricity demand), would forecast stock drop below Op MIN within the next 5 days? if yes, Emergency. If no, Alert.* ***AND*** *Is gas facility operational? If yes, Alert.* ***AND*** *Is interconnector available? If yes, Alert.*	*Seek interim/top up delivery*
Emergency ***[Level 3]***			*Resolve by recommended and exceptional measures. May include non-market-based measures:* *direct support / intervention from NDCA to arrange delivery outside of commercial arrangements* *utilise future solidarity agreement for electricity agreed between Italy and Malta* *utilise all electricity sources to reduce gas demand* *enforce electricity demand reduction and load shedding.*

Table 3 - Specific Emergency Measures

5.2 Preventive and Preparatory Measures

5.2.1 Preventive market-based measures

There is currently very little scope in Malta for market-based measures to ensure the availability of active power reserves within the existing generation supply contracts. Consideration is being given to whether there is suitable land-based supply/demand/load management capability that could be accessed through market-based measures.

5.2.2 Preventive non-market-based measures

Such measures include ensuring that existing accident/disruption prevention and response measures are effectively implemented, ensuring an active and resilient capability for the island-mode operation of the electricity system

5.2.3 Strategic preparatory measures

Measures being actively considered and adopted include:

- Preparing and testing various incident management and emergency response plans across all of the Major Incident Scenarios [MIS] identified in the National Risk Assessment [NRA]
- Preparing a black start system recovery plan to implement upon blackout
- Maintaining N-1 system resilience for supply of critical elements of the energy infrastructure, including key supplies and components
- Diversifying sources of energy supply, including seeking to access viable indigenous renewable energy sources
- Reducing electricity demand growth and introducing flexible demand response
- Enabling LNG to be sourced from alternative international sources
- Developing different sourcing options and procedures for short notice replacement of LNG floating storage unit
- Implementing commercial arrangements for the provision of strategic parts / specialist contractors
- Implementing a comprehensive Business Continuity Management program.

5.2.4 Operational preparatory measures

Measures adopted include:

- Monitoring and reporting of gas supply/demand/stock levels systematically forecasting use needs
- Testing short-term use of large end-user demand-side measures
- Ensuring effective physical security arrangements in place and wider national security measures encompassing security of energy supply facilities
- Ensuring that operators follow good operational and maintenance procedures verified by periodic tests to support compliance with the Control of Major Accident Hazards (COMAH) Regulations and engineering inspections and reporting to appropriate National Authorities
- Where practicable, activating the manual override capabilities of gas and electricity facilities and control systems
- Carrying out regular cybersecurity tests on critical energy infrastructure
- Checking and verifying the availability of critical spares and contractors
- Demonstrating an ongoing capability to move FSU off the mooring jetty and onto storm moorings

- Testing and evaluating detailed and practical requirements for replacing the FSU.

5.3 Measures to mitigate electricity crises

Measures to mitigate an electricity supply crisis in Malta are limited due to the relative size and island geography, as well as due to the absence of a liquid wholesale electricity market or retail market. Demand side electricity market measures are limited to forward purchase of electricity from the Italian market, whilst supply-side options are limited. Malta is also limited by the capacity of the sub-sea connector.

5.3.1 Non-market-based measures – (application of Article 16 to Malta)

There are currently no wholesale or retail energy markets operating in Malta. Consequently there are no rules for the suspension or restoration of market activities. As far as is practicable, non-discriminatory principles are applied to all users of the distribution network when taking measures to prevent or mitigate electricity crises.

5.3.2 Applicable regional and bilateral measures.

No formal regional measures are currently in place. Discussions regarding a solidarity agreement for electricity with Italian authorities are ongoing in line with Article 15 of the Risk Preparedness Regulation. (Note: Principally such measures shall be bilateral agreements with Italy).

5.4 Load shedding

5.4.1 When the Distribution System Operator needs to decrease consumption, the only option beyond voluntary constraint will require automatic and manual reductions in demand, i.e., Load Shedding.

5.4.2 Manual load shedding is implemented when the available supply (land-based generation and PV and sub-sea connector flow from Sicily) is insufficient to meet demand. These circumstances are considered and the actions to be taken are outlined in Table 2, above. In the case of a prolonged disruption affecting the ability to supply electricity to Malta, electricity rationing may be necessary, restricting customers' consumption of electricity.

5.4.3 Load restrictions over the longer term can be achieved by one or more of the following methods:

- Public appeals by the Maltese Government for voluntary restraint.
- Orders or directions under the Civil Protection Act requiring restrictions on consumption by industry, commerce and other undertakings.
- Directions under the Enemalta Act (Act No. XXXIV of 2014, as amended).

5.4.4 To support both the electricity risk preparedness and gas security of supply preventive and emergency plans, the arrangements necessary to support effective and equitable manual load shedding shall be formalised in three key steps: establishing a list of protected sites, identifying vulnerable electricity customers, and formalising a rota disconnection process.

Establishing a list of designated sites	Identification of vulnerable electricity customers	Formalising a rota disconnection process
•Sites dependent on continuous electricity supply and providing essential services are identified and protected from supply disruption;	•Provisions are made to identify and protect vulnerable electricity customers; •Individual consumers where the continued supply is critical to their well-being	• A Rota Disconnection Plan is formalized to ensure supplies of electricity are shared as equitably as possible between areas

5.5 Prioritised Operators

5.5.1 In practice, load shedding is principally set in the following order:

- Commercial
- Residential
- Industrial
- Critical infrastructure.

5.5.2 Sites are classified *Prioritised* if they require electricity supply maintained to provide services in accordance with the following criteria:

- Support national or regional critical needs
- Provide for public health and safety, or
- If the loss of electricity supply has the potential to result in catastrophic damage to nationally strategic or high value plant.

5.5.3 Critical sites which shall be protected from an electricity supply disruption can be broadly grouped, but not limited to, the main categories of sites listed below. The groups are also broadly aligned to the list of critical infrastructure held by the Critical Infrastructure Protection Department [CIPD].

Groups of facilities providing the designated service
1) LNG reception terminal, storage and regasification facilities
2) Electricity Generators and Distribution and System Operator facilities
3) Oil reception terminals, storage facilities and pumping stations
4) Major ports, harbours, airports and associated control facilities
5) Essential water and sewerage installations and facilities
6) Hospitals and critical health related facilities
7) Digital and telecommunication facilities (where there is a national need for continued operation)
8) Emergency Services and Armed Forces of Malta sites and facilities that provide civil protection support
9) National Emergency Control Room

5.5.3 Critical loads are essentially required by Mater Dei Hospital, Gozo Hospital, and all Reverse Osmosis (RO) Plants *de rigeur*. Industrial consumers deemed to be of high priority include the Malta Freeport, ST Microelectronics and others.

5.5.4 At present, no national process is in effect for critical infrastructure/(consumers) to systematically curtail their load during an emergency; such curtailment is undertaken on an *ad hoc* basis. It shall be appreciated that, due to the nature of the Maltese network, load shedding is inherently indiscriminate, except for the critical/important consumers indicated.

5.5.5 As part of the ongoing Business Continuity Management Programme, Enemalta plans to generate and list individual site data details relevant to *Prioritised* operators.

5.5.6 Prioritised operators shall be required to establish and maintain appropriate business continuity arrangements that support their respective capabilities to sustain an adequate supply of services in the event of an electricity crisis.

5.5.7 Prioritised operators shall be required to make adequate provision to be able to reduce their load upon request by Enemalta, in the event of an electricity crisis. If the situation deteriorates and the risk of shortfall of supply to these users is imminent, priority shall be given to preventing loss of life and to minimising the risk of disaster that could involve loss of life or major damages to critical infrastructure. This approach is recommended by the European Commission in Art. 15 RPR Guidance document and is required to be followed by entities in Malta when establishing the list of designated sites and prioritising between them.

5.6 Rota Disconnections (Manual Load Shedding)

5.6.1 A Rota Disconnection Plan (RDP), produced and maintained by the Distribution System Operator, is planned for. The RDP shall ensure the stability of the distribution grid, and that the available supplies of electricity in an (electricity supply) emergency are shared as equitably as possible amongst all non-prioritised sites, whilst considering the need for the prioritisation of designated sites.

5.6.2 The RDP shall establish the time blocks and zonal patterns to be adopted in the event that demand reduction through rota disconnections becomes necessary.

5.7 Priority Services Register (PSR)

5.7.1 A PSR is planned, to identify and protect vulnerable electricity customers.

5.7.2 Provisions shall be made to ensure that vulnerable electricity customers can be identified and protected during an energy supply crisis. This process shall require the co-operation of several public and private sector bodies principally in health and social care. This should include all electricity consumers for whom the continued supply is critical to their continued well-being:

- Disabled or chronically sick persons, or persons having long-term medical conditions, hearing or visual impairment or have additional communication needs,
- Persons of pensionable age,
- Persons otherwise in a vulnerable situation due to dependency on a continuous electricity supply.

5.7.3 The Distribution System Operator shall support PSR arrangements by providing:

- Advance notice of power cuts,
- Information on alternative energy supplies during emergencies.

5.8 Automatic Load Shedding [ALS].

5.8.1 An ALS programme would kick in before manual load shedding is triggered. In the case of a prolonged electricity supply shortage affecting Malta, electricity rationing may be necessary, restricting the consumption of certain electricity customers.

5.8.2 Enemalta has implemented three (3) load shedding systems, which are used in emergency situations. The load shedding systems operated by Enemalta are the following:

- Fast Load Shedding (FLS)
- Supervisory control and data acquisition (SCADA) control system-enabled load shedding
- System under-frequency load shedding
- (Note: Each system is used in a specific type of emergency or crisis).

5.8.3 The Fast Load Shedding system automatically sheds an amount of load equivalent to the prevailing sub-sea connector import following its loss. It also handles load shedding when Delimara 4 power plant and the sub-sea connector are not in operation concurrently.

5.8.4 The SCADA load shedding system protects against overloading of the sub-sea connector and against excessively large step changes in power imported over the sub-sea connector.

5.8.5 The under-frequency load shedding system is used to restore grid system frequency stability in situations where the frequency drops during a major disturbance such as loss of generation.

5.9 Mechanisms to Inform the Public about an Electricity Crisis.

5.9.1 Internal procedures determine how Enemalta communicates and manages communications with stakeholders in the event of a planned or unplanned power outage, including an *Emergency Communications Plan* [ECP]. The DSO works closely with the Crisis Coordinator to implement the planned communication strategy for network outages in the event of an electricity supply crisis event.

5.9.2 The ECP details how information will be disseminated to customers and other stakeholders. It provides examples of communications Enemalta will use to make sure a timely message reaches each audience.

5.9.10 Enemalta provides a free service including e-mail/SMS notifications regarding planned outages, including upcoming scheduled network maintenance and upgrades which may lead to planned power cuts.

5.10 Regional and Bilateral Procedures and Measures

5.10.1 Whilst no formal agreement of co-operation currently exists between the Government of Malta and the Government of Italy, the NDCA actively dialogues with Italian stakeholders as and when necessary, in order to sustain mutual support, co-operation,and assistance in a spirit of solidarity in line with Article 15 of the Risk Preparedness Regulation.

5.10.2 A bi-lateral agreement shall seek to establish the mechanisms for bilateral cooperation and ensure appropriate coordination before and during electricity crises, including the decision-making procedures for appropriate reaction between Malta and Italy.

5.10.3 Arrangements are in place between the Italian TSO and Enemalta regarding the planning and operation of the availability and capacity of the sub-sea connector between Malta and Sicily. The nominal maximum capacity of quantities to / from Sicily to Malta via the subsea connector is 200MWe (192MWe) in Summer, and 225MWe (216MWe) in Winter.

6.0 CRISIS COORDINATOR

6.1 The ministry responsible for energy is responsible for maintaining overall command, control, communications and co-ordination during an energy crisis event, including a Major Incident Scenario.

6.2 The Permanent Secretary (to the ministry responsible for energy) is the designated Crisis Coordinator. The designated Crisis Coordinator is effectively, the political level coordinator in a crisis, for the purposes of the *Risk Preparedness Plan (Electricity Crises)*, acting as the focal point at political level.

6.3 Role of the Crisis Co-ordinator.

The role of the Crisis Co-ordinator is to ensure the following:

- The necessary actions are taken to prevent and to prepare for an energy supply crisis event.
- That emergency response and recovery plans, arrangements and solutions are effective, timely and co-ordinated.
- That communication systems relating to energy crises are effectively implemented and capable of connecting and coordinating internal and external stakeholders.

6.3.1 ECC Responsibilities: Pre-NEC Events

Prior to any crisis event, the ECC, on a routine and regular basis, shall:

- Ensure procedures are effectively in place to assess potential energy crisis scenarios.
- Ensure the clear and timely notification of changes in energy supply crisis levels.
- Ensure that, on a biennial basis, response to electricity, gas and energy supply crisis scenarios are subject to real-time simulation testing, and findings / recommendations from these emergency tests are reported to the NDCA.
- Review the *Electricity Risk-Preparedness Plan* and *Gas Security of Supply Preventive Action Plan (PAP) Emergency Plan (EP)* and ensure that these documents are formally reviewed and updated at least once every four years in line with the obligations under the Risk Preparedness Regulation and Gas Security of Supply Regulation, respectively.

6.3.2 ECC Responsibilities: During NEC Events

During a National Energy Crisis, the ECC shall be responsible for:

- Providing for effective and timely communication between the Government bodies affected, the Distribution System Operator (Enemalta), gas and electricity facility operators, the energy regulator, high dependency electricity users and emergency response teams.
- Directing that information is made available to the public, concerning the nature of the emergency, dangers and hazards it carries and measures towards its resolution.
- Ensuring the clear and timely notification of changes in energy supply crisis levels, including the de-escalation or resolution of an energy supply crisis to Malta CIPD, the lead MHSR agency responsible for the protection of critical infrastructure.

- Facilitating the coordination, mobilisation, and monitoring of the execution of measures for overcoming the crisis and for reporting to Government. (Note: In case of sudden onset of an emergency, the ECC shall co-ordinate with CIPD and the CPD to ensure the timely and coherent flow of information and provision of emergency responders essential to control the energy crisis).
- Working with other agencies and persons involved in the resolution of the emergency on their tasks, their division of responsibilities and the order of importance of the implementation.
- Setting the energy supply recovery objectives to which the emergency response activities contribute.
- Facilitating the exchange of information between agencies and persons participating in the resolution of an emergency or persons involved in the resolution of an emergency, including ensuring the situational awareness of the Government and other ministries emergency management structures and determine on the involvement of other agencies and persons (involved in the resolution of the emergency and directly affected by the emergency).
- Liaising with other Government ministries to ensure that the European Commission, the Electricity Coordination Group, Gas Coordination Group, and other affected Member States are kept informed on issues related to the energy supply crisis, as necessary.

6.3.3 ECC Responsibilities: Post NEC Events

Following the emergency / crisis the Crisis Coordinator shall be responsible for:

- Ensuring that the process is in place to capture a complete and accurate information picture of key data relating to the consequences of the crisis event.
- In co-operation with other Authorities, compiling the initial report to assess the impact of the crisis event on energy supply and other vital services on behalf of the NDCA and provide this to the Energy regulator within the required time frames.

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7.0 STAKEHOLDER CONSULTATION

7.1 In accordance with Article 10(1), this section outlines the mechanism used for and the results of the consultations carried out, for the development of the NRPP-ES, with:

- Electricity and natural gas undertakings.
- Relevant organisations representing the interests of non-industrial electricity customers.
- Relevant organisations representing the interests of industrial electricity customers.
- Regulatory authorities.
- The transmission system operators.
- Relevant distribution system operators.

7.2 As gas and electricity facility operators in the energy sector in Malta are entirely interdependent the stakeholder consultations undertaken in depth to address the gas security of supply plans have also formed the basis for the stakeholder consultations for the electricity risk preparedness plan. The NDCA for Malta, along with the EWA, consulted with the following stakeholders for the purpose of developing the Gas Security of Supply Plans:

- Electricity and natural gas undertakings
  i. ElectroGas Malta (electricity producer, LNG supplier and facility operator)
  ii. Enemalta plc (electricity distribution system operator, sole electricity supplier, emergency electricity producer and operator of the subsea connector)
  iii. D3 Power Generation ltd (electricity producer)
  iv. Melita TransGas Co. Ltd (Project Promoter of PCI 5.19 and prospective TSO for Melita TransGas Pipeline)

- Relevant organisations representing the interests of households - REWS (Regulator for Energy and Water Services)

- Relevant organisations representing the interests of industrial gas customers, including electricity producers
  i. Enemalta plc (electricity distribution system operator)
  ii. ElectroGas Malta (electricity producer)
  iii. D3 Power Generation ltd (electricity producer)

- National Regulatory Authority - REWS (Regulator for Energy and Water Services)

- Other Stakeholders
  i. Transport Malta (Transport Authority)
  ii. CPD (Civil Protection Department)
  iii. CIPD (Critical Infrastructure Protection Directorate)
  iv. OHSA (Occupational Health and Safety Authority)
  v. ERA (Environment and Resources Authority)

7.3 The mechanism for consultation included an initial outreach describing the NDCA's obligations and conducting detailed explanations regarding why the stakeholder had been identified in the first instance. Subsequent meetings were systematically organised with the objective of briefing the respective stakeholders fully on what information was required from them to prepare for the consultation.

7.4 The NDCA consulted broadly and systematically with stakeholders and interested parties, conducting detailed information gathering with which to inform and produce the NRRP-ES.

7.5 Stakeholder consultations shall be sustained beyond the initial iteration of the NRPP-ES, including all stakeholders and potentially interested parties where applicable.

7.6 For the specific aspect where the electricity risk preparedness plan extends beyond aspects covered in the Gas SoS arrangements, the Competent Authority for Malta, the EWA and Enemalta have further consulted with the industry regulator and internally with Enemalta concerning specific electricity distribution grid and sub-sea interconnector operations, as well as existing emergency test procedures.

7.7 An additional consultation on the Risk Preparedness Plan was carried out with MHSR, to assess the role of all relevant civil protection bodies in an electricity supply disruption, the role of the CIPD in the event of a national emergency, in contingency planning, as well as the implementation of cyber-security measures within critical energy infrastructure.

7.8 Relevant stakeholders identified above were also requested to review Malta's finalised Risk Preparedness Plan prior to the submission to the European Commission and its publishing in accordance with the requirements of the RPR.

7.9 Additional consultations are expected with the Italian authorities and Italian TSO for the purpose of establishing bilateral solidarity measures as per Article 15 of the RPR.

8.0 EMERGENCY TESTS

Emergency tests enable the energy supply sector in Malta to assess and improve resilience in a crisis (or a major incident scenario), by testing and validating key emergency response assumptions and practising response procedures to major incident in a controlled environment.

8.1 Background and Context

8.1.1 Test Requirement.

Emergency tests in Malta's Energy supply sector shall be carried out to meet the requirements of EU Regulations:

- Reg. [EN]: 2017/1938 – Concerning measures to safeguard the security of gas supply, and
- Reg. [EN]: 2019/941 – On risk-preparedness in the electricity sector.

Due to the nature of Malta's gas and electricity infrastructure and limited available resources, real time exercises that simulate an emergency resulting from high or medium-impact energy supply crisis scenarios are consolidated into a single *National Emergency Test Programme for Energy*.

8.1.2 National Context – Limitations and Constraints

Malta operates a singular gas infrastructure facility (the LNG terminal and regasification plant) and one sub-sea connection to the Italian electricity network. Additionally, a restricted capacity of generation reserve / back-up generation needs to be factored into risk evaluations. In practice, such tight-coupling implies that simulating the removal of either the gas facility or the sub-sea connector for a real-time emergency test could critically expose electricity supply.

Therefore, whilst periodic real time (or accelerated) real time emergency tests and exercises are undertaken, test exercises are purposely planned to utilise a combination of desktop walk-through tests, functional tests, and facility-specific emergency response exercises held on site.

8.1.3 Test Methodology.

The *National Emergency Test Programme for Energy* combines testing and evaluating compliance regulatory requirements and existing emergency test measures. The programme includes individual emergency test exercises that, where practical, support and are co-ordinated with other emergency test exercises that affect the energy supply in Malta. To address specific regulatory requirements the Test Programme shall:

- Indicate the calendar of the tests (including biennial bilateral real time test exercises),
- Indicate the procedures for conducting the tests,
- Identify which *actors* will be involved in the test(s).

The Programme shall ensure that specific tests are planned to incorporate both regional and specifically national crisis scenarios.

8.2 Regional and Bilateral Arrangements

8.2.1 Bilateral Arrangements.

The NDCA plans to initiate detailed bilateral discussions with Italy on procedures for undertaking annual or biannual reviews of emergency preparedness plans. These discussions will be initiated as soon as the relevant preliminary work on content has been completed to allow for meaningful discussion and planning. (see section 8.3.4).

8.2.2 Existing Operational Arrangements.

Existing arrangements are in place between the Italian TSO (TERNA) and the Maltese DSO (Enemalta) that enable the day-to-day management of the subsea connector between Malta and Sicily. These procedures include capacity availability and nomination, and the management of planned and un-planned outages.

8.3 Timetable / Calendar for Emergency Test Exercises

8.3.1 Frequency.

The NDCA shall plan and make arrangements for real-time simulation Emergency Test exercises to be carried out at least every two years. Additional, interim desktop or *walk-through test exercises* may also become necessary to assess emergency response capability in response to changing circumstances or emerging risks in the intervening period.

8.3.2 Preparation.

Real-time simulation exercises require preparation and detailed planning. Sufficient time shall be allowed to develop detailed credible scenarios ahead of each bi-annual test exercise. Whilst endeavouring to reflect real-time operational environment these tests shall be planned and timetabled to minimise risk and disruption to normal operations.

8.3.3 Test Calendar.

The calendar of emergency test exercises for the National Emergency Test Programme for Energy, for the period 2022/25 is shown in Table 4 below:

Emergency Test Plan Type	*Plan Detail / Scope*	*Date*
Real-time emergency test	***Tsunami Preparedness Exercise – Scenario Simulation***	***Nov 2021***
Interim desk top only exercise	*Simulated cyber and physical attack*	*2022*
Biennial real-time emergency test	***National Emergency Test with regional dimension***	***2023***
Interim desk top only exercise	*To be determined*	*2024*
Biennial real-time emergency test	***National Emergency Test with regional dimension***	***2025***

Table 4 - Emergency Test Calendar

8.3.4 Regional Co-ordination.

Arrangements on how to test bilateral mutual assistance and coordination measures with Italian parties are currently being investigated by the NDCA together with Enemalta as the main operator. The conclusion of these discussions will be considered when planning and scheduling emergency test exercises.

8.4 Objectives and Purpose of Emergency Tests

8.4.1 Objective.

The *National Emergency Test Programme for Energy* and individual emergency test exercises shall reflect realistic high and medium impact crisis scenarios impacting upon Malta's energy supply. These scenarios are intrinsically aligned with the National Risk Assessment [NRA] developed by MHSR as well as the sector-specific regional and national energy crises scenarios. Exercises shall include development of time-based events (injects) unfolding from realistic scenario models of energy supply and demand that include short-term and seasonality factors. Scenarios will be based on *reasonable worst case* of electricity demand and electricity and energy (LNG, gas, and gasoil) supply. Exercises will be planned to enable emergency responses to be simulated in real time in accordance with the emergency plans.

When carrying out emergency test exercises, weaknesses in systems, processes, resources, training, and technical capabilities that form part of the preventive measures and emergency response measures shall be identified and documented.

8.4.2 Assess Bilateral Emergency Co-ordination.

Realistically, such assessments shall include co-ordination between the Maltese and Italian authorities when faced by an energy supply crisis. The overall objective shall be to test and assess the effectiveness of operational communication and information exchange capabilities relating to managing the capacity availability of the sub-sea connector between Enemalta and TERNA.

8.4.3 Co-ordination.

At the operational level, the objective is to test the coordination between potentially affected actors, stakeholders, and other parties. These shall include, but are not limited to, testing the gas facility operator, generation plant operators, emergency services, health and social services, other government ministries, large energy users, water services, waste services and transport service providers. [C-Ref: Section 6.6].

8.4.4 Emergency Procedures.

- To test the latest active emergency procedures, including operational capability to implement and manage switching between alternative electricity supply sources in real time, including the coordination of relevant parties (gas facility operator, generation plant operators and TERNA)
- To test the ability to implement manual load shedding and to protect supplies to priority customers in real time whilst maintaining a stable electricity supply
- To test the effectiveness of communication between operational parties.
- To test the efficiency of communication between National-level stakeholders.
- To test mechanisms used to communicate with and inform the public during an energy crisis.

8.4.5 Rehearsal and Training.

Emergency test exercises shall provide a safe environment for parties to carry out emergency response training for staff and contractors.

8.4.6 Emergency Readiness.

Emergency test exercises shall test the respective abilities and capabilities of the emergency responders, gas facility operator, the electricity system (generation, distribution and critically dependant end users), communication networks, the harbour facilities, health and social services and other stakeholders to respond to an emergency in real time.

8.4.7 Crisis Trigger Points.

The emergency test will seek to validate trigger mechanisms for non-market-based measures, and the triggers for crisis level escalation and de-escalation.

8.4.8 Identify Gaps and Omissions.

- To identify risks and crisis scenarios that were not previously foreseen.
- To identify weaknesses or failures in expected emergency response arrangements.
- To identify any relevant actors not included in the emergency planning process.

8.5 Procedure

8.5.1 Energy Emergency Test – Exercise Programme.

The NDCA shall establish the National Emergency Test Programme for Energy that meets the regulatory and legislative requirements for the electricity and gas sector for Malta. The programme defines when and how individual Emergency Tests exercises are carried out to meet the objectives set out in section 8.4 above. The overall process is shown in Figure 3 – Emergency Test - Exercise Planning Procedure, at the end of this section.

8.5.2 Exercise Terms of Reference.

For each real time simulation exercise the NDCA shall set out a high-level *realistic worst case energy supply risk scenario*. This shall be based on the current analysis and understanding of electricity gas and other energy related supply risks. The NDCA shall obtain the endorsement and support of senior stakeholders (see section 7.6) in each planned emergency test exercise. Based on the scenario and stakeholder engagement, the NDCA shall draw up the terms of reference, goals, and objectives for the emergency test real-time simulation exercise.

8.5.3 Exercise Team.

The NDCA may generally delegate the responsibility for forming the Emergency Test Exercise team to other stakeholders, primarily Enemalta in the lead. The Exercise Team shall be responsible for formulating detailed plans and arrangements, running the exercise, and drafting the subsequent report. On the basis of recommendations from the Emergency Test Team the NDCA shall review and endorse:

- The detailed scenario
- The scenario timeline
- The exercise methodology (i.e. desktop/ walkthrough / functional and *in situ* real time simulation)
- Key performance targets for the test exercise.

8.5.4 Detailed Exercise Development and Planning.

- The Exercise team shall develop the Emergency Test exercise in order to test the effectiveness of the procedures established in the respective Emergency Plans.
- The Exercise Team shall define the expected results from the exercise, so that actual preparedness against expectation can be measured against pre-set performance metrics. Guidelines shall include testing procedures for the exchange of information and cooperation between affected parties.
- The Exercise team shall develop the necessary detailed narrative and *inject*s for a credible energy supply crisis scenario test. The exercise team shall also prepare briefing notes and guidance for the exercise participants.

8.5.5 Live Exercise.

- During the exercise, the exercise support team shall record the time and details of primary decisions and actions made in the execution of the exercise. All relevant supply, demand and environmental data shall also be captured. The NDCA shall independently observe the exercise and may wish to appoint a delegate to act as the Energy Crisis Co-ordinator for the purpose of the exercise itself.

8.5.6 De-brief and Draft Report.

- Directly following the exercise termination there shall be (a) debrief session(s) attended by all exercise participants. Based on their observations and the supporting data the exercise team shall draft a report that compares the expected against the actual results.
- This will include explanations of where the differences originate and what actions are necessary to resolve any gaps. It shall also include proposals / improvements to resolve the errors found, and recommendations for updating or revising the Emergency Plans.
- The draft report shall be made available to the NDCA within one month of the conclusion of the test.

8.5.7 Final Report.

- The NDCA shall review the exercise report and recommend changes. Once finalised and agreed by the NDCA the report will be issued to the Commission within three months of the conclusion of the test.
- A summary description and main results of each Emergency Test exercise along with details of issues identified and recommendations will be documented. These will be used to update the periodic (4 year) revision of the Gas Security of Supply Preventive Action

Plan and Emergency Plan under the Gas Security of Supply Regulation, and the Risk Preparedness Plan under the Electricity Risk Preparedness Regulation.

- The results of the tests shall also be presented as appropriate, at the Electricity and Gas Coordination Groups by the NDCA.

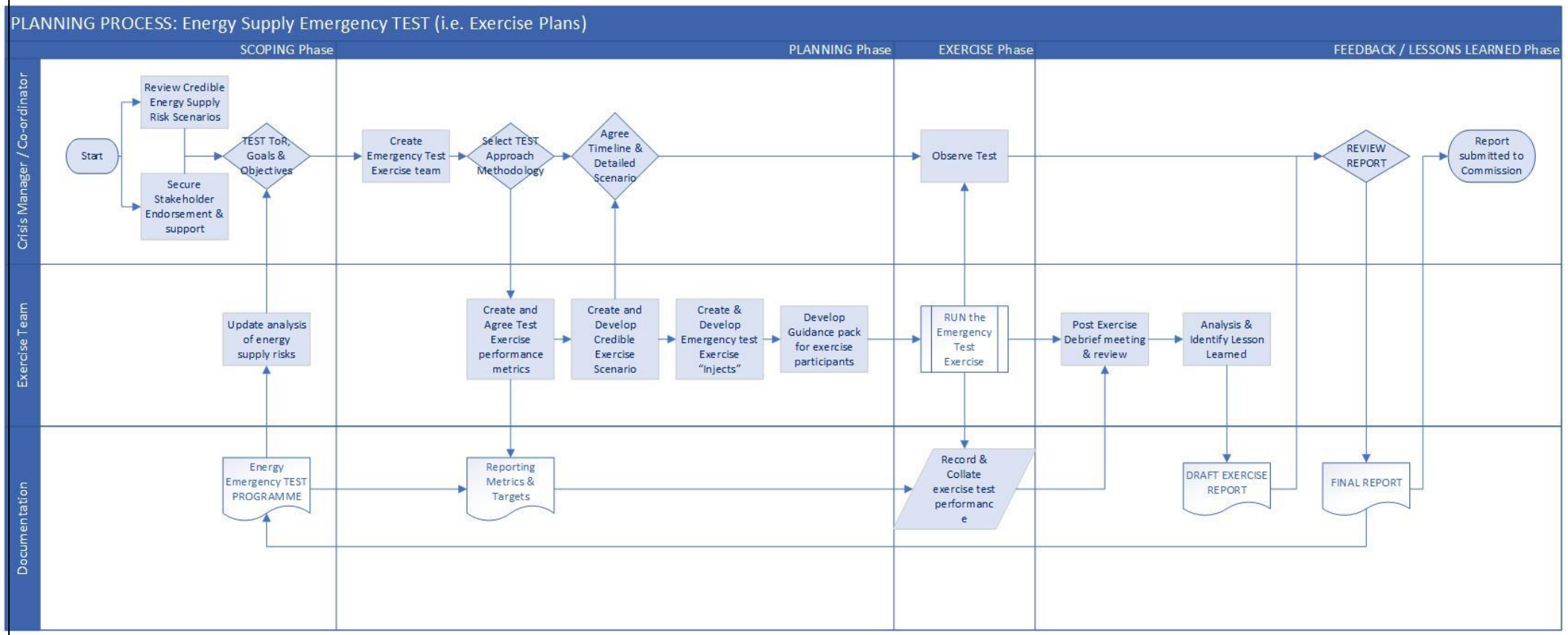

Figure 3 – Emergency Test - Exercise Planning Procedure

8.6 Relevant Actors, Parties and Stakeholders

8.6.1 Description of the Main Parties.

The energy sector in Malta consists of the electricity distribution system operator and generator of last resort, two independent generators, the industry regulator, the executive branch of the ministry and electricity consumers and customers. At a regional level, the primary relationship is with the Italian NDCA and TERNA, Italian TSO (Transmission System Operator). These parties shall be involved as appropriate by the NDCA as consultees and may be participants in the energy emergency test exercises.

8.6.2 Schedule.

The specific actors, parties and stakeholders within the electricity sector and their primary duties are the following:

The Energy and Water Agency (EWA):	The policy branch of the ministry responsible for energy. EWA is responsible for drafting and implementing energy (and water) policy for Malta and provides technical and policy support to the Ministry.
Enemalta plc:	Electricity Distribution System Operator - responsible for forecasting demand, scheduling generation, and maintaining a balanced and stable grid.
Generator of last resort:	D2 and Marsa Power plant).
Trasmissione Elettrica Rete Nazionale [TERNA]	Italian grid Transmission System Operator (TSO), responsible for providing on-the-day balancing electricity via sub-sea connector between Sicily and Malta.
Italian NDCA	Directorate General for Energy Supply, Efficiency and Competitiveness Italian Ministry of Ecological Transition
ElectroGas Malta	Electricity baseload generator (D4); Supplier of natural gas and LNG facility operator
D3 PG Ltd	Electricity peak load generator (D3)
Malta Critical Infrastructure Protection Directorate (CIPD) (MHSR)	National coordinator of emergency and disaster management for critical infrastructure (incl. cyber-security)
Civil Protection Department (CPD) Ministry for Home Affairs, Security,	Emergency first responders Liaison with Police and Armed Forces of Malta

Reforms and Equality (MHSR)	
Ministry for Health (MFH)	Ministry responsible for health services, occupational health and safety, and health services regulations and standards
The Water Services Corporation (WSC)	Responsible for the water cycle: from production and distribution to the collection and treatment of wastewater
Regulator for Energy and Water Services (REWS)	Responsible for regulating and monitoring the production and use of energy
The Environment and Resources Authority (ERA)	Responsible for the Environment and Resources, within different Directorates
Transport Malta (TM)	Ports Authority Roads and Infrastructure Airport and public transport

END OF REPORT

END NOTES:

[i] *Civil Protection Act (Chapter 411 of Laws of Malta):*
http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8877&l=1

[ii] *Emergency Powers Act (as amended):*

https://legislation.mt/eli/cap/178/eng/pdf

[iii] *Civil Protection Act (Chapter 411 of Laws of Malta)*

[iv] *The Enemalta Act (Act No. XXXIV of 2014)*

[v] (EC/Reg) 2017/1485:
https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017R1485

[vi] (EC/Reg) 2017/1938:
https://eur-lex.europa.eu/legalcontent/EN/TXT/?uri=uriserv:OJ.L_.2017.280.01.0001.01.ENG

[vii] (EC/Reg) 2017/2196
https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32017R2196

[viii] (EU/Reg) 2019/943
https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019R0943

[ix] (EU/Reg) Regulation (EU) 2019/941
https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2019.158.01.0001.01.ENG

[x] (EC/Reg) Council Directives
https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32008L0114

[xi] (EU/Reg) 2019/941
https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016L1148&rid=1