Appendices

to the

EIA Coordinator's Statement regarding modifications to the Combined Cycle Gas Turbine and Liquefied Natural Gas Receiving, Storage, and Re-gasification Facilities at the Delimara Power Station as proposed by ElectroGas Malta Limited (EGM) following the submission in 2016 of the Addendum to the Environmental Impact Statement (EIS) regarding the aforementioned development.

Appendix One

EGM variations document

IPPC Permit Renewal
Variations

1. SUMMARY

This document provides an overview of the variations that shall be put forward for the upcoming renewal process of IPPC permit IP 0002/07/Gi – ElectroGas Malta Ltd

2. DESCRIPTION OF VARIATIONS

A. – Not in use –

This section has been purposely left blank.

B. Ship-to-Ship transfer - LNG offloading

In order to ensure that inventory levels aboard the FSU will always satisfy Malta's security of supply requirements and the scheduling requirements of EGM and Enemalta, EGM will at times require to offload a volume of LNG stored in the floating storage unit 'LNG Armada Mediterrana', onto an LNG carrier.

The offloading operation will be from the FSU to an LNG carrier ("LNGC"), the same as the LNGC that visits Delimara to replenish the FSU's LNG reserve. Moreover, all procedures followed, as well as the safety and security arrangements will be the same as any other ship-to-ship transfer operation that is regularly carried out at the terminal.

The HAZOP conducted by OSL consulting engineers in November 2020 (OS-0928-OSLI-HRP-0001-D00) on this operation concluded the following:

"*EGM intends to extend the operational scope at the FSU to add flexibility to the LNG delivery scheduling and to limit the risk of excess LNG stock and security of supply to the Gas Facilities. From the FSU perspective, this new operation will involve reverse LNG flow to a visitor cargo. Depending on the state of the LNG visitor cargo, three different operations are foreseen; gassing up, cooling down and LNG offloading of small volumes of LNG. Each of these operations have been risk assessed within this HAZOP workshop. The HAZOP is conducted on the basis that there will be simultaneous send out to shore.*

The existing Safety Studies and other operational permits for the Project did not consider any reverse flow to any visitor cargo; however, the FSU systems in place are designed for it as it is a common shipping operation. This new operation requires a minor software modification to the ESD Cause & Effect matrix and there is a Management of Change (MOC) which the designer company will implement."

C. Glycol expansion tank upgrade

An additional expansion tank was installed to reduce pressure fluctuations within the glycol loop. The tank has been placed inside the bunded areas within the Regasification area.

D. Improved Power Supply Feeder

In order to reduce the dependency on the previously sole powerful existing power supply feeder to the regasification plant, a second robust supply was installed. This was executed through the upgrading of the existing 11kV circuit-breakers on unit no. 52 power generator, within the combined cycle power plant and an installation of a transformer at the Regasification Plant. Cables were run between the upgraded 11kV circuit-breakers and the new transformer to feed the Regassification plant - replacing the existing weak feeder. This activity was exempted from requiring development permission.

E. Addition of FSU Boil-Off Gas Attemperator

The Boil Off Gas attemperator is a nozzle which sprays LNG into the Boil Off Gas to cool it before it is sent to the BOG recovery compressors.

At present we cannot stop and start the compressors at the ideal temperature, so we are required to keep the compressors running to avoid undue wear on the compressor pistons. This continuous running increases maintenance and operating costs.

The initial engineering phase during which the tie in points, instrumentation and control systems are defined, has been completed. The next stage will include the detailed design.

F. Improved bunding of make-up water glycol tank

The current make-up water glycol tank was moved to the main bunded area within the Regasification plant, such that the present bunding of this tank is improved. This move will further reduce the risk of groundwater contamination.

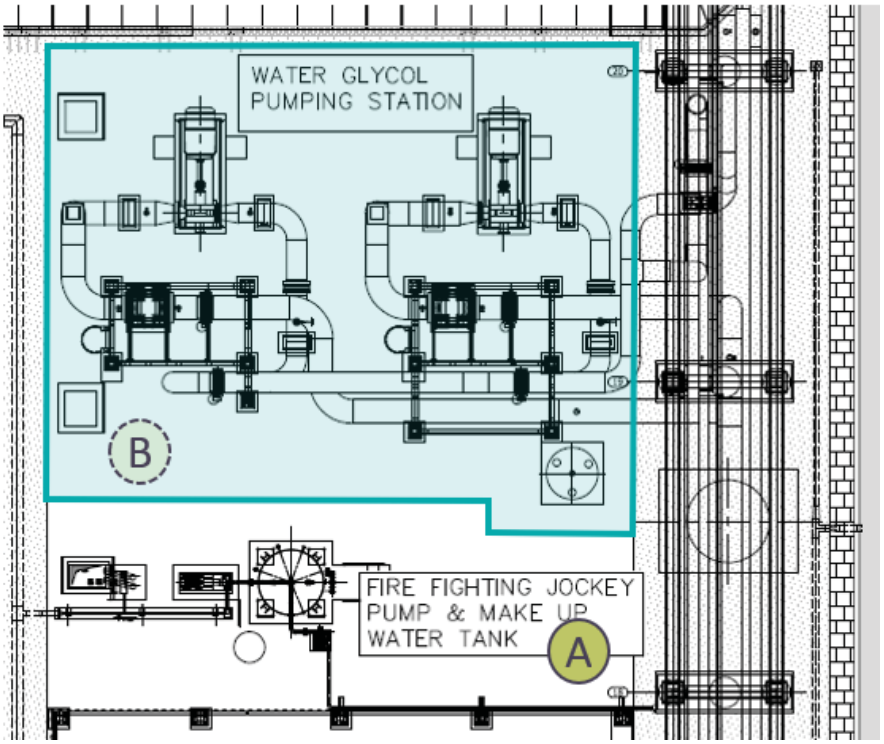


Figure 1 - Site plan showing current (A) and planned location (B) for make-up water glycol tank. Shaded area represents the main Regas bunded area.

G. Improved pressure control for LNG send out pumps through Kongsberg upgrade to K-chief system

The LNG send out pumps on the FSU are designed to work with flow or pressure control. However, flow control was found to be unsuitable during load changes. Pressure control is preferred and required for the boil-off gas attemperator.

Kongsberg will make some set up changes to the LNG pump control system and use a signal from a transmitter at the manifold rather than at the pump head. Initial engineering has been completed.

H. Introduction of Oily Water Separator at Regasification Site

An above ground oil water separator was installed in the regasification area, the purpose of which is to receive wastewater generated from the operational activities of air compressors. The effluent is monitored and if compliant it is discharged in outlet point number 6.

I. Oil Boom

A 300-meter oil boom has been installed on the quay adjacent to the Delimara 4 portacabin offices. This oil boom allows for quick and efficient deployment in case of an oil spill within our sea area.

Figure 2 - Oil boom installed on the quay adjacent to the Delimara 4 portacabin offices.

J. D4 Portacabin Offices Sewage Collection

Previously, the sewage generated from the restrooms located in the portacabin offices in the Delimara 4 area was being collected in an above ground sewage tank which was emptied periodically by a sewage waste collection contractor. These D4 portacabin restrooms have now been connected to the municipal sewer discharge point.

The latest Public Sewer Discharge Permit issued for the sewage point in the D4 area was issued in August 2020, subject to the quarterly monitoring of FSU grey water.

K. Installation of Chemical Stores used in plant operation/maintenance (at both generation and regasification sites)

Two 20-foot containers were placed on site as shown in the site plan below, in order to be utilised as chemical stores within the Delimara 4 area.

Figure 3 - Image showing the chemical store containers in D4 area.

A COSHH locker was also installed for the safe storage of chemicals within the Regas area.

Figure 4 - COSHH locker installed in Regasification area.

L. Installation of office facilities

A total of sixteen 20-foot portacabins have been installed in Delimara 4 area to be used as offices. The portacabins have been placed such that a row of 8 units placed adjacent to each, are stacked on top of another row of 8 units. Layouts of the ground floor and the 1st floor are shown in Figure 6, whereas Figure 7, shows the location of these portacabins. Planning Authority's decision to grant permission for these offices (PA/04297/18) was posted on 17th November 2018, with commencement date being 10th December 2018.

Figure 5 - Image showing the Delimara 4 Portacabin Offices.

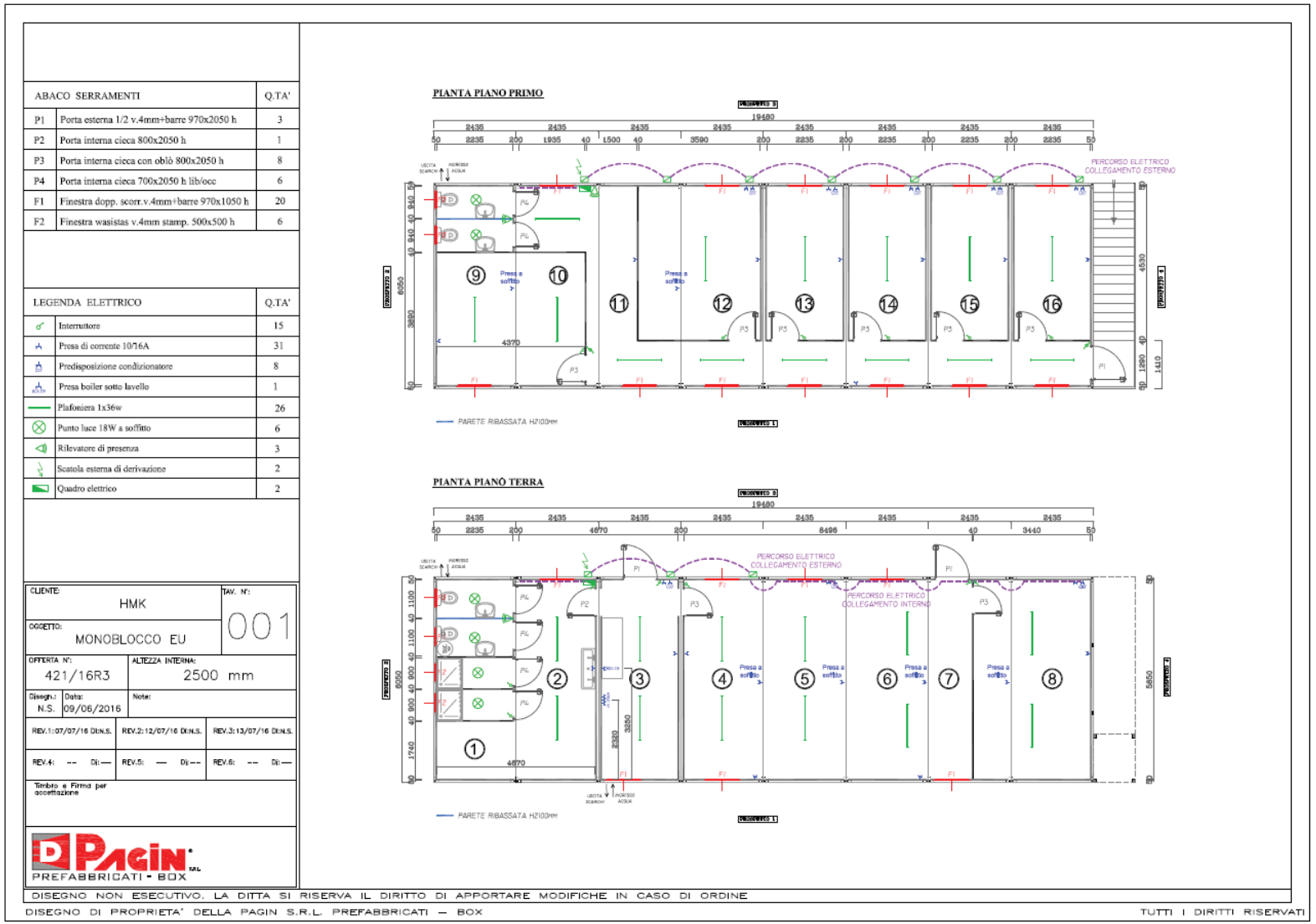


Figure 6 – As-built plans of the Delimara 4 Portacabin Offices.

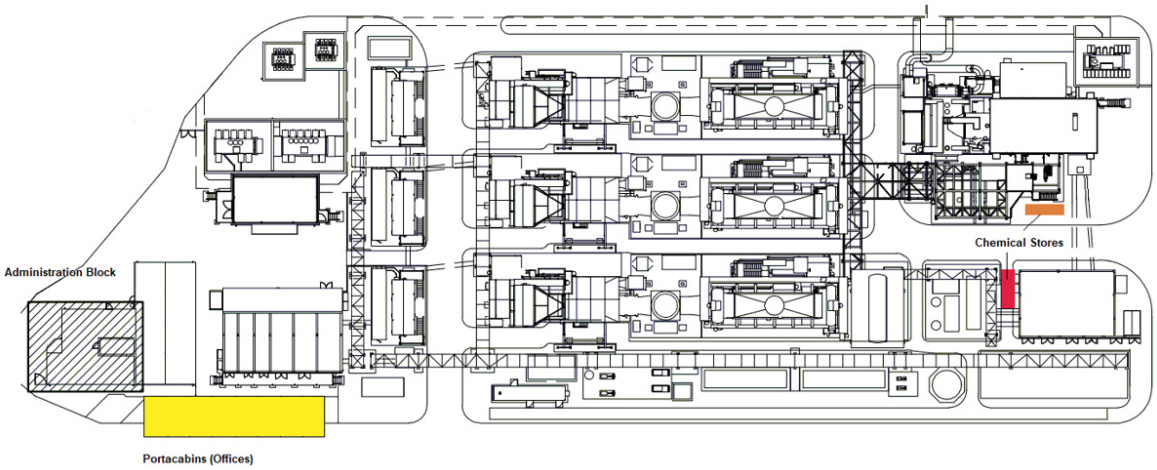


Figure 7 - Site plan of Delimara 4 area showing the locations of the Portacabin Offices (yellow) and the Chemical Stores (red & orange).

A new modular office building was installed in the Regasification area and is composed of 16 modules distributed over two floors, the arrangement of which is shown in Figure 9. The installation of cabins in the re-gasification area together with storage containers (PA/04118/18), was granted permission by the Planning Authority, with 12th November 2018 as the commencement date.

Figure 8 - Regasification portacabin offices.

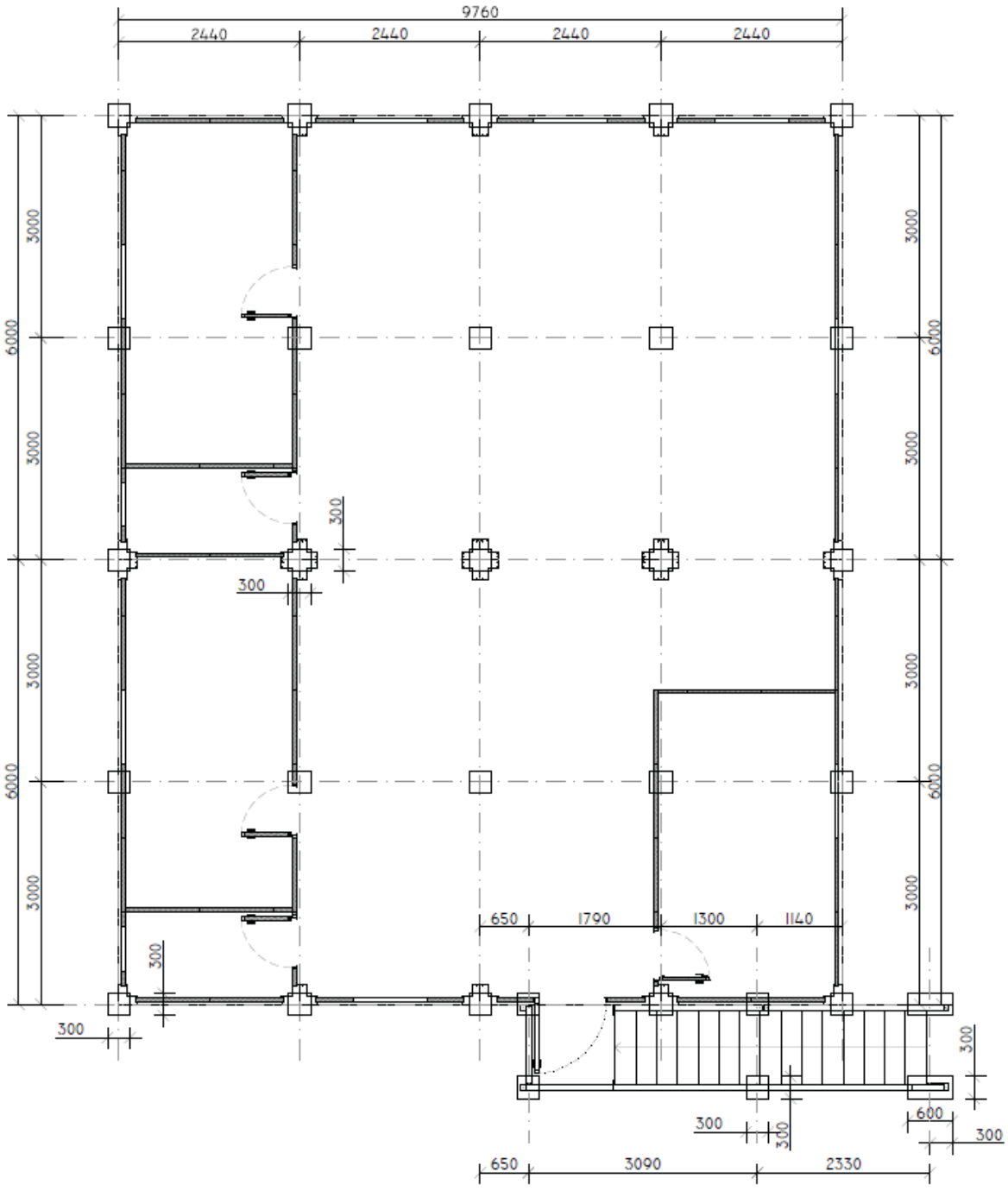


Figure 9 - Layout showing the portacabin arrangement of Reganosa offices.

M. Installation of A/C units and updating of F gas register

Several new air-conditioning units were installed around the Delimara Power Station. This is reflected in the Register of Ozone Depleting Gases EGM-HSE-EMR-06.

N. Upgrade to reflect changes in fire suppression systems in line with regulations

Currently the local control room of each of the three gas turbines and the 2nd CWP electrical container, have smoke detectors, but are not equipped with a fire suppression system.

Plans for the installation of an IG-55 Argonite fire suppression system in each of the three GT control rooms and the 2nd CWP electrical container are being drafted.

Furthermore, electrical buildings within the regasification area are equipped with an FM200 fire suppression system. In light of the reduction of HFC gas quantities as per EU F Gas Regulation 517-2014, alternative options are being investigated to replace FM200.

O. New cooling water pump

A second main cooling sea water pump, identical to the present one was installed in order to increase the reliability of the Steam Turbine through redundancy to improve security of supply. This additional pump did not increase volume flow.

This main cooling sea water pump replaced decommissioned D1 equipment.

P. Removal of AST and QAL 2 testing requirement for GT bypass stacks

The original design of D4 Plant consisted of one Continuous Emission Monitoring System (CEMS) installed on each main stack only since operation in open cycle was expected to be only for a very limited number of hours per year. Because of the time difference between Open Cycle (OC) taking over and Combined Cycle (CC) taking over, ERA had asked for CEMS readings on the bypass stacks as well during this period. This was achieved by having only one CEMS equipment but exhaust sampling switching over from main and bypass stack and gas sample conditioning system.

Back in July 2018, EGM asked ERA for a derogation from the IPPC permit to perform ASTs and QAL2 testing of the bypass stacks. In theory the emissions from the main stack and the bypass stack should be the same since there is no emission abatement equipment installed downstream the gas turbines and the only emission abatement technology used is the Dry Low NOx Burners. This was verified through the ASTs that were performed on all stacks in January 2019. The results showed that with one correction curve in EMIDATE (software for collection and processing of raw emission data) the ASTs passed on both the main and bypass stacks. These results have been shared with ERA in April 2019.

EGM also points out that Open Cycle operation is very limited; 115hrs GT51, 88hrs GT52 and 113hrs GT53 (period Aug 2018 to Aug 2019). These are well below the 500hrs specified in Directive 2010/75/EU which states that ”*Gas turbines and gas engines for emergency use that operate less than 500 operating hours per year are not covered by the emission limit values set out in this point. The operator of such plants shall record the used operating hours”*. Besides, to perform ASTs/QAL2 on bypass stacks EGM will have to operate in Open Cycle mode just for these tests. This has a negative impact not only on efficiency but also to the environment – more CO2 emissions per unit of power dispatch, which could be avoided.

Following the above EGM again asks ERA to reconsider the requirement to perform ASTs and QAL2 on the bypass stacks. The AST and QAL2 calibration of the main stack will cover for that of the bypass stack.

Q. Cooling water mixing chamber

The cooling water mixing chamber was created to permit the connection of the D4 seawater piping to the main outfall using the D1 seawater pipes.

In light of the fact that the D1 plant is now fully decommissioned, the mixing chamber is now for the sole use of D4 and should therefore be recognised as such.

R. Inert Gas Generator

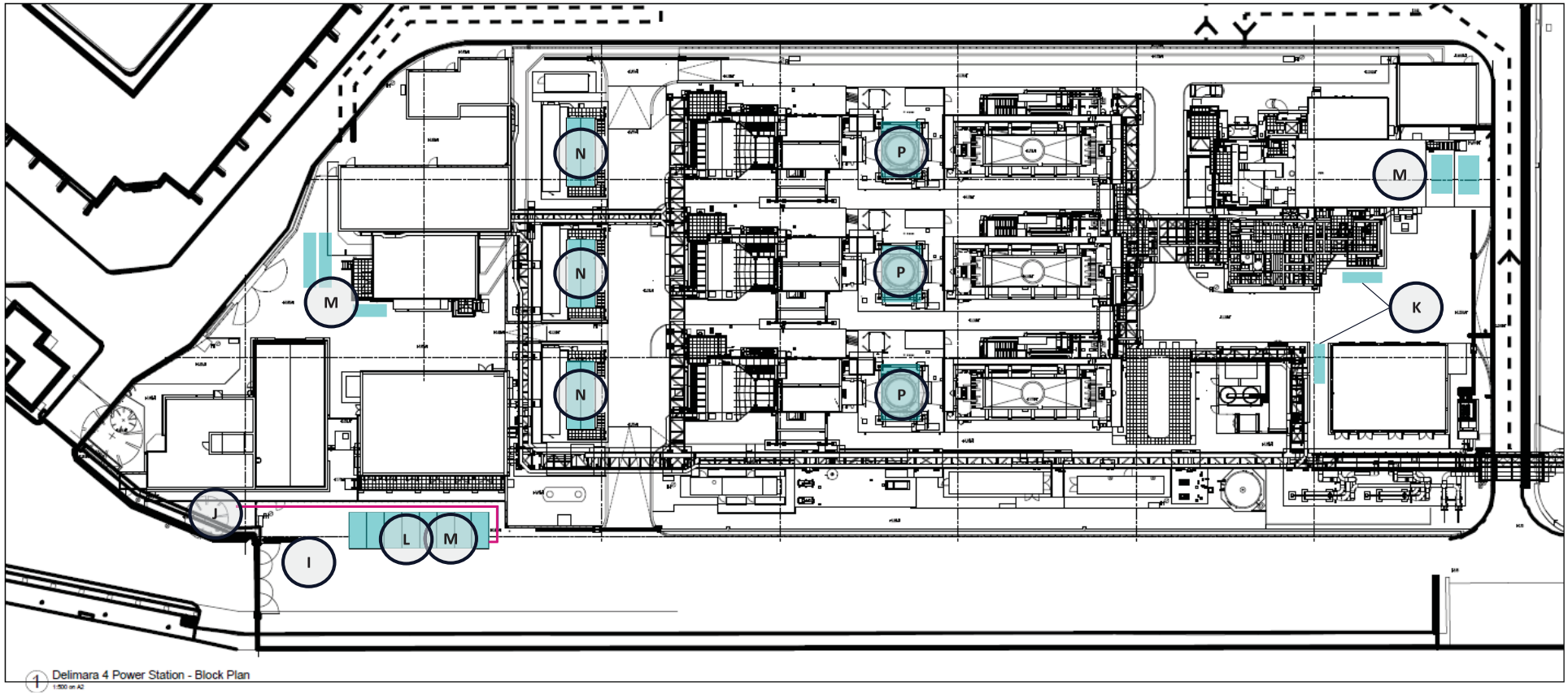
Reference is made to the Inert Gas Generator ("**IGG**") system on board the Floating Storage Unit, as described in section B1.2 Non-Technical Description of the original IPPC application (prepared by AECOM on behalf of ElectroGas Malta), and other supporting documentation. It has been noted during the FSU Class Certification processes and Environmental Management System auditing processes that the IGG system is not clearly referenced in the IPPC permit issued.

The IGG on board the FSU is a Sasakura Moss engine which operates at a 50% load at a rated thermal input of 7.2 MWth to generate inert gas through combustion of good quality fuel oil, to generate dry air having limited oxygen content after treatment through cleaning and cooling apparatus. Two main outputs as a result of this process are the air output into the tanks, that are eventually released to the air after use and the sea water outlet from the scrubbing system.

Locations of Variations

Variation	Letter
Ship-to-Ship transfer - LNG offloading	B
Glycol expansion tank upgrade	C
Improved power supply feeder	D
Addition of FSU Boil Off Gas Attemperator	E
Improved bunding of make-up water glycol tank	F
Improved pressure control for LNG send out pumps through Kongsberg upgrade to K-chief system	G
Introduction of Oily Water Separator at Regasification Site	H
Oil Boom	I
D4 Portacabin Offices Sewage Collection	J
Installation of Chemical Stores used in plant operation/maintenance (at both generation and regasification sites)	K
Installation of office facilities	L
Installation of A/C units and updating of F gas register	M
Upgrade to reflect changes in fire suppression systems in line with regulations	N
New cooling water pump	O
Removal of AST/QAL 2 testing requirement for GT bypass stacks	P
Cooling water mixing chamber	Q
Inert Gas Generator	R

Delimara 4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1 Delimara 4 Power Station - Block Plan
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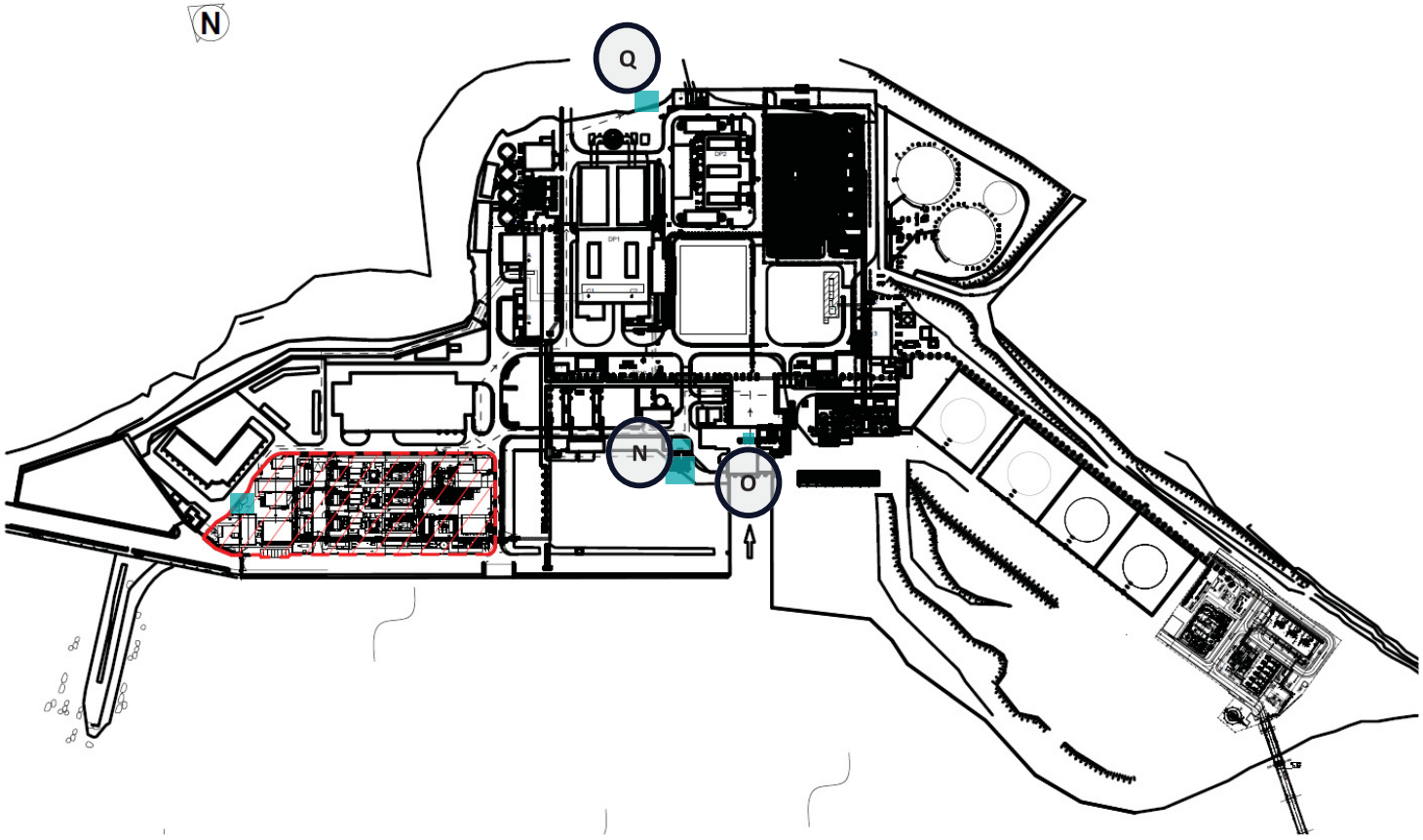
Delimara Power Station



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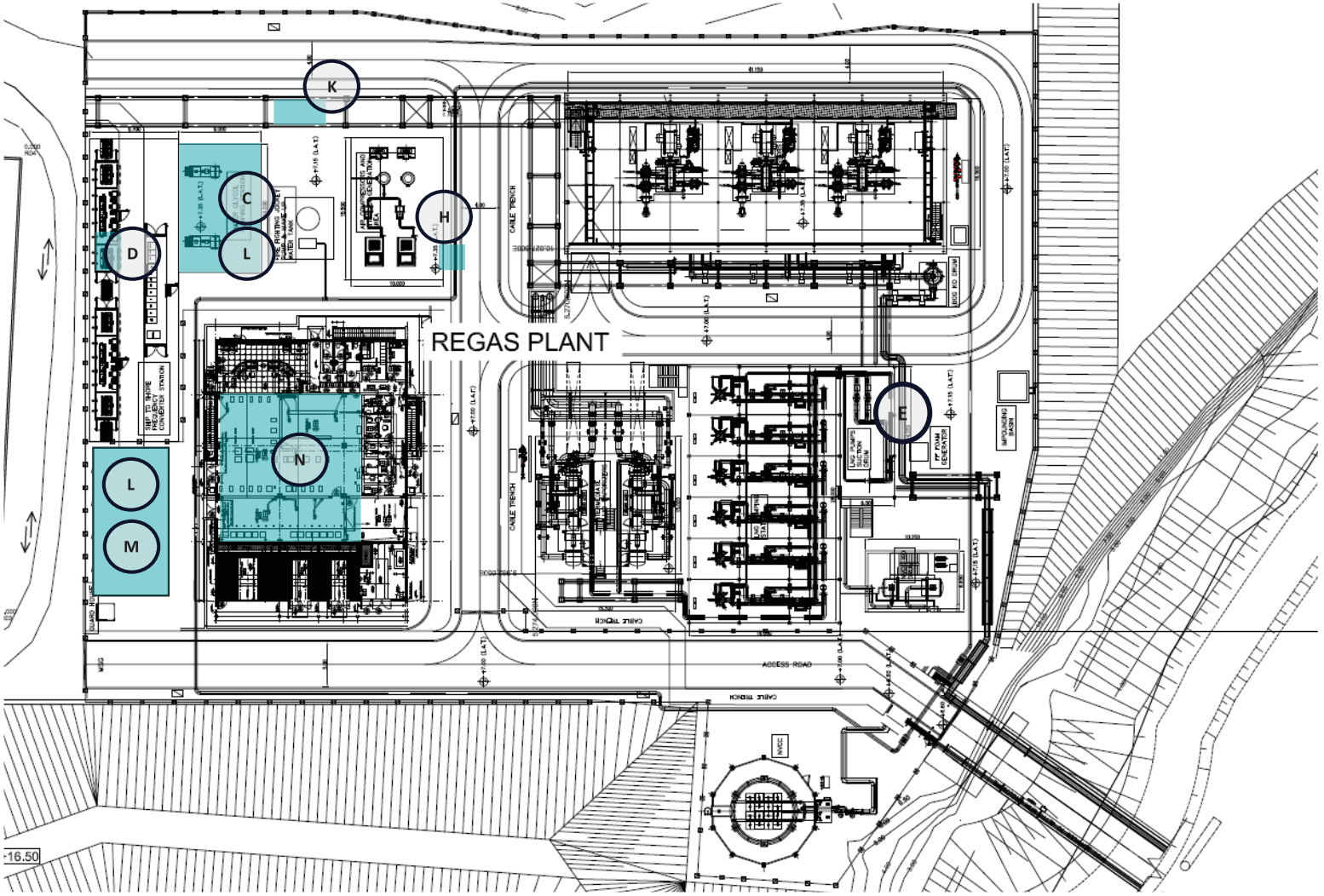
REGAS PLANT
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Appendix Two

Marine Water Quality

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Report reference number: 076-21_R
Report reference: ERSLI-150621-EGM IPPC permit renewal variations - marine water quality
Date: 28th September 2021

TECHNICAL STATEMENT

Update to the marine water quality study forming part of the environment impact statement for the proposed CCGT and LNG storage and regasification plant at the Delimara Power Station in view of IPPC permit renewal variations

Client: ElectroGas Malta Ltd.
Block D, Ta' Monita,
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PREAMBLE

Ecoserv Ltd received a request from ERSLI Consultants, acting on behalf of ElectroGas Malta (henceforth 'EGM'), operators of the Delimara Power Station's CCGT and LNG plant (henceforth 'plant'), to submit a statement of assessment of the potential impacts on marine water quality resulting from the IPPC renewal variations (henceforth 'variations') proposed by the latter company. The request is for the technical statement to be made by Professor Joseph A. Borg (hereafter 'consultant'). Specifically, the technical statement should indicate: (i) which of the IPPC permit variations are deemed to potentially affect marine water quality; and (ii) for each of the variations identified as potentially affecting marine water quality, determine potential changes to the assessment of impacts contained in the report of the marine water quality study (Axiak, 2013)[1] prepared as part of the Environment Impact Statement (EIS) for the Delimara Power Station project. Reference will also be made to the technical statement by Axiak (2016)[2] prepared in

[1] Axiak, V. 2013. Delimara Gas and Power: Combined Cycle Gas Turbine and Liquefied Natural Gas receiving, storage and regasification facilities. Environmental Impact Statement - Assessment of Environmental Impacts on Water Quality of Proposed Project. Report submitted to Enemalta Corporation (Final version dated 4 December 2013). Ecoserv, Ltd., Malta. Unpublished report; 92 + 19 pp.
[2] Axiak, V. 2016. Addendum to: Delimara Gas and Power: Combined Cycle Gas Turbine and Liquefied Natural Gas receiving, storage and regasification facilities. Environmental Impact Statement - Assessment of Environmental Impacts on Water Quality of Proposed Project. Report submitted to Enemalta Corporation (Final version dated 4 December 2013). Ecoserv, Ltd., Malta. Unpublished report; 92 + 19 pp.

response to proposed small modifications to the design[3] for the proposed CCGT/LNG storage and regasification plant at the Delimara Power Station, and to Ecoserv's (2016) statement dated 13th September 2016[4] concerning proposed modifications to specifications of the Floating Storage Unit (FSU) and changes to the location and mooring system of same.

The proposed variations are as follows:

B. Ship-to-Ship transfer - LNG offloading
C. Glycol expansion tank upgrade
D. Improved power supply feeder
E. Addition of FSU Boil Off Gas Attemperator
F. Improved bunding of make-up water glycol tank
G. Improved pressure control for LNG send out pumps through Kongsberg upgrade to K-chief system
H. Introduction of Oily Water Separator at Regasification Site
I. Oil Boom
J. D4 Portacabin Offices Sewage Collection
K. Installation of Chemical Stores used in plant operation/maintenance (at both generation and regasification sites)
L. Installation of office facilities
M. Installation of A/C units and updating of F gas register
N. Upgrade to reflect changes in fire suppression systems in line with regulations
O. New cooling water pump
P. Removal of AST/QAL 2 testing requirement for GT bypass stacks
Q. Cooling water mixing chamber
R. Inert Gas Generator

The present document comprises the requested technical statement in relation to assessment of the potential impacts on marine water quality of the IPPC renewal variations listed above that are deemed as being relevant within the context of possible impacts on water quality.

METHODOLOGY

The following documents provided by Electrogas were considered during compilation of the present statement:

1. Document titled 'IPPC permit renewal variations'
2. Document titled 'Variations on plan'

Essentially, the first document ('IPPC permit renewal variations') presents the variations listed under the Preamble section above and, for each, a brief description of the relative variation is given therein. The second document ('Variations on plan') presents drawings that are relevant to the variations and help one gain an understanding of the layout of the area / structure / source where the variation is located.

[3] Proposal included modifications to the design of the jetty.
[4] Ecoserv (2016). Technical statement: Addendum to assessment of environmental impacts on water quality forming part of the environment impact statement for the proposed CCGT and LNG storage and regasification plant at the Delimara Power Station, Malta. Malta: unpublished report, 12 pp.

APPRAISAL

Examination of the description for each of the 19 proposed variations resulted in the following short-list that are deemed relevant within the context of possible impacts on marine water quality:

- Ship-to-Ship transfer - LNG offloading
- Improved pressure control for LNG send out pumps through Kongsberg upgrade to K-chief system
- Introduction of Oily Water Separator at Regasification Site
- Oil Boom
- New cooling water pump
- Cooling water mixing chamber
- Inert Gas Generator

A brief description of each variation and assessment of the potential impacts on marine water quality for the respective variation, follows.

Ship-to-Ship transfer - LNG offloading (B)

At times, it will be necessary to offload a volume of LNG stored in the floating storage unit 'LNG Armada Mediterrana', onto an LNG carrier. Essentially, such offloading operation from the FSU to a LNG carrier (which is the same one that visits Delimara to replenish the FSU's LNG reserve), comprises a reverse process to that wherein LNG is transferred from the carrier to the FSU. Depending on the state of the LNG visitor cargo, three different operations are foreseen; gassing up, cooling down and offloading of small volumes of LNG.

The HAZOP[5] conducted by OSL consulting engineers in November 2020 (OS-0928-OSLI-HRP-0001-D00) concluded that each of the offloading operations has been risk assessed within the HAZOP workshop. The HAZOP is conducted on the basis that there will be simultaneous send out to shore. The existing Safety Studies and other operational permits for the Project did not consider any reverse flow to any visitor cargo; however, the FSU systems in place are designed for it, as it is a common shipping operation. This new operation requires a minor software modification to the ESD Cause & Effect matrix and there is a Management of Change (MOC) which the designer company will implement. All procedures will be followed, and safety and security arrangements will be the same as any other ship-to-ship transfer operation that is regularly carried out at the terminal.

The main source of potential impact of this operation on marine water quality has been identified as **spillage of LNG to the marine environment** during the operational phase. However, the solubility of methane (main constituent of LNG) and other LNG alkanes in seawater is very low. Axiak (2013) states *"The occasional and operational releases of methane from the LNG Plant are expected to be low and generally not sufficient to increase the level of methane in the water column, except possibly in the immediate vicinity of the plant. The only instances when levels of methane in the water column would be expected to be significantly high, will be in the case of major LNG spill accidents. In such cases, methane levels in the surface seawater may be expected to exceed background levels by a factor of 10 to 100 times."* Furthermore, any potential adverse effects from spillage of LNG will depend on the amount released, which in turn will depend on preventive measures and on response time in the eventuality of an accident. In the original assessment of impacts on marine water quality, (Axiak, 2013) states that the level of significance of the impact of atmospheric fallout from gases produced by plant during the operational phase, including potential spillage of LNG, to be **low**. Given that the HAZOP will be in place and that all procedures will be the same as any other ship-to-ship transfer operation, the proposed 'Ship-to-Ship transfer - LNG offloading' variation is deemed **to not result in any**

[5] Hazard and operability study.

changes to the impacts on marine water quality as already detailed for this aspect in Axiak (2013), and where relevant in Axiak (2015) and Ecoserv (2016).

Improved pressure control for LNG send out pumps through Kongsberg upgrade to K-chief system (G)

This variation is related to the previous variation (B) 'Ship-to-Ship transfer - LNG offloading' in the sense that the stated pumps will be located on the FSU and will serve to pump LNG to the Regassification Site. The proposed variation will result in better pressure control of the LNG pumps, which should therefore result in reduced risk of LNG spillage resulting from some malfunction involving pressure control in the system that conveys the LNG to the Regasification Unit.

As for the previous variation (B), the main source of potential impact of this component on marine water quality is **spillage of LNG to the marine environment** during the operational phase. In the original assessment of impacts on marine water quality, (Axiak, 2013) states that the level of significance of the impact of atmospheric fallout from gases produced by plant during the operational phase, including potential spillage of LNG, to be **low**. Since the present variation comprises an improvement in pressure control, it should reduce further the risk of LNG spillage, and hence result in a lower level of potential adverse impact on marine water quality. Therefore, the proposed variation 'improved pressure control for LNG send out pumps through Kongsberg upgrade to K-chief system' is deemed **to not result in any changes to the impacts on marine water quality** as already detailed for this aspect in Axiak (2013), and where relevant in Axiak (2015) and Ecoserv (2016).

Introduction of Oily Water Separator at Regasification Site (H)

EGM describe this variation as representing installation of an above-ground oil water separator in the regasification area, the purpose of which is to receive wastewater generated from the operational activities of air compressors. The effluent is monitored and if compliant it is discharged at Discharge Point 1[6]; see Figure 1.

Monitoring of discharges to sea, including in the vicinity of Discharge Point 1, undertaken by Ecoserv Ltd (Ecoserv, 2021) in April 2021, indicated no alteration of water quality in the vicinity of the plant and FSU, including during the FSU's pre-tank and post-tank inerting phases. Specifically, Ecoserv's (2021) report concludes: *"The main conclusion from the present monitoring session is that the activities related to the deaeration of the IGG tank, during both the pre-tank inerting and post-tank inerting phases, have not had any appreciable effects on / did not result in changes to water quality, with respect to the parameters considered in the present assessment."*

The main source of potential impacts on marine water quality concerning this variation **arises from discharges to sea** during the operational phase. Specifically, the possible introduction of toxic substances and contaminants potentially present in the wastewater may have acute or chronic effects (see Axiak, 2013) on marine biota. However, installation of an oily water separator is expected to result in reduced levels of potential contaminants / toxic substances that may be present in the discharged effluent, such that potential adverse impacts on the marine environment, and hence on marine water quality, are further reduced compared to the absence of oil separators. In the original assessment of impacts on marine water quality (Axiak, 2013), the overall level of the impact of wastewater streams discharged from the plant was deemed to be moderate (as worst case scenario) to low. Considering that the proposed variation is expected to lead to an improvement in quality of the discharge at Discharge Point 1, the proposed variation 'Introduction of Oily Water Separator at Regasification Site' is deemed **to not result in any changes to the impacts on marine**

[6] In the document titled 'IPPC permit renewal variations', this is erroneously indicated as Discharge Point 6.

water quality as already detailed for this aspect in Axiak (2013), and where relevant in Axiak (2015) and Ecoserv (2016).

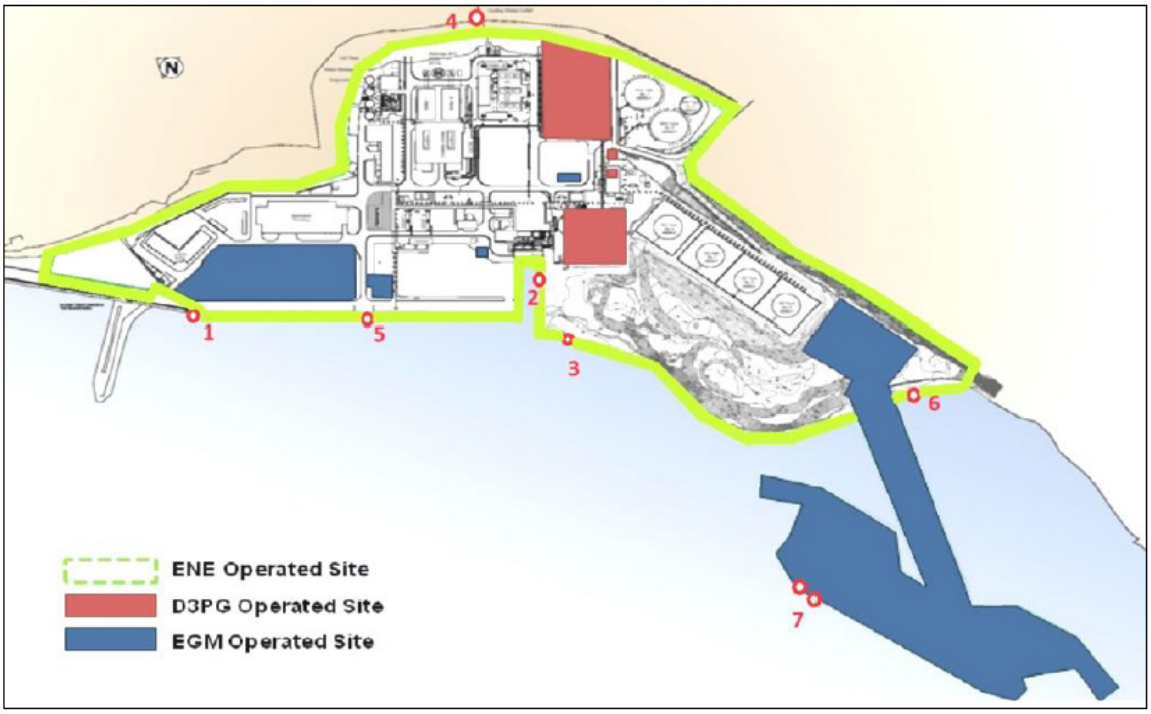

Figure 1: Effluent discharge points (1, 4, 6 and 7) pertaining to EGM's operations. Discharge Point 1: Runoff from EGM's Operated Site; Discharge Point 4: Cooling effluent discharged at il-Hofra z-Zghira; Discharge Point 6: Effluent from the Regassification Unit; Discharge Point 7: Effluent from the FSU. Discharge points 2, 3 and 5 do not relate to EGM's operations.

Oil Boom (I)

EGM have installed a 300-meter oil boom on the quay adjacent to the Delimara 4 portacabin offices. The oil boom allows for quick and efficient deployment in case of an oil spill within the adjacent sea area. Since the oil boom is located on land and will only be deployed at sea in the eventuality of an oil spill, in which case the latter is deemed to potentially have a much higher level of impact on marine water quality than deployment of the boom and would need specific assessment when and if a spill occurs, this variation 'oil boom' is deemed **to not result in any changes to the impacts on marine water quality** in Axiak (2013), and where relevant in Axiak (2015) and Ecoserv (2016).

New cooling water pump (O)

EGM have installed a new main cooling sea water pump that is identical to the one already in use and which is included in the existing IPPC permit. The new pump was installed following freeing up of physical space in the area as a result of D1 decommissioning, and is aimed at increasing reliability of the steam turbine through redundancy to improve security of supply. Only one of the pumps is operational at any given time; hence installation of the second pump provides backup and ensures continuity of operations, should there be issues with either of the two pumps. Installation of the second pump does not result in any changes to the volume and physico-chemical characteristics of the thermal effluent released at Discharge Point 4 (see Figure 1).

In the original assessment of impacts on marine water quality (Axiak, 2013), it was concluded that the considerable reduction in the discharge rate of the cooling waters at Hofra z-Zghira that will result from the change of the plant to using LNG as fuel may be viewed as a **positive moderate** impact on water quality at this locality. As a worst case scenario, the impact was deemed to be **neutral**. Given that 'new cooling water pump' will not result in changes to the physico-chemical characteristics and volume of discharges to the marine environment, including at il-Hofra z-Zghira, this variation is deemed **to not result in any changes to the impacts on marine water quality** as already detailed for this aspect in Axiak (2013), and where relevant in Axiak (2015) and Ecoserv (2016).

Cooling water mixing chamber (Q)

EGM installed a cooling water mixing chamber to allow connection of the D4 seawater piping to the main outfall using the D1 seawater pipes. In the meantime, the D1 plant has been fully decommissioned, such that the mixing chamber is now for the sole use of D4. Overall, such modification will not result in any changes to the volume and physico-chemical characteristics of the thermal effluent released at Discharge Point 4 (see Figure 1).

In the original assessment of impacts on marine water quality (Axiak, 2013), it was concluded that the considerable reduction in the discharge rate of the cooling waters at Hofra z-Zghira that will result from the change of the plant to using LNG as fuel may be viewed as a **positive moderate** impact on water quality at this locality. As a worst case scenario, the impact was deemed to be **neutral**. Given that the present variation 'cooling water mixing chamber' will not result in changes to the physico-chemical characteristics and volume of discharges to the marine environment, including at il-Hofra z-Zghira, it is deemed **to not result in any changes to the impacts on marine water quality** as already detailed for this aspect in Axiak (2013), and where relevant in Axiak (2015) and Ecoserv (2016).

Inert Gas Generator (R)

EGM refer to the Inert Gas Generator (IGG) on board the Floating Storage Unit, as described in section B1.2 Non-Technical Description of the original IPPC application (prepared by AECOM on behalf of ElectroGas Malta), and other supporting documentation. During the FSU Class Certification and Environmental Management System auditing processes, it was noted that the IGG system is not clearly referenced in the IPPC permit issued. EGM clarifies that the IGG on board the FSU is a Sasakura Moss engine which operates at a 50% load at a rated thermal input of 7.2 MWth to generate inert gas through combustion of good quality fuel oil, to generate dry air having limited oxygen content after treatment through cleaning and cooling apparatus. Two main outputs as a result of this process are the air output into the tanks, that are eventually released to the air after use and the sea water outlet from the scrubbing system. The effluent output from the IGG is represented by Discharge Point 8 in Figure 2. Monitoring of discharges to sea, including in the vicinity of Discharge Point 8, undertaken by Ecoserv Ltd (Ecoserv, 2021) in April 2021, indicated no alteration of water quality in the vicinity of the plant and FSU, including during the FSU's pre-tank and post-tank inerting phases. Specifically, Ecoserv's (2021) report concludes: *"The main conclusion from the present monitoring session is that the activities related to the deaeration of the IGG tank, during both the pre-tank inerting and post-tank inerting phases, have not had any appreciable effects on / did not result in changes to water quality, with respect to the parameters considered in the present assessment."*

In any case, the present clarification does not entail any operational change to the IGG; hence the present variation 'inert gas generator' is deemed **to not result in any changes to the impacts on marine water quality** as already detailed for this aspect in Axiak (2013), and where relevant in Axiak (2015) and Ecoserv (2016).

Figure 2: Effluent Discharge Point 8 (IGG).

Taking the above into consideration, overall, it is deemed that the IPPC variations described above:

(i) will not result in any changes to the impacts on marine water quality as already detailed in Axiak (2013), and where relevant in Axiak (2015) and Ecoserv (2016);

(ii) will not result in any different impacts on the chemical status of MTC107 other than those already detailed in Axiak (2013), and where relevant in Axiak (2015) and Ecoserv (2016);

(iii) do not call for any different mitigation measures other than those already detailed in Axiak (2013), and where relevant in Axiak (2015) and Ecoserv (2016);

REFERENCES

Axiak, V. 2013. Delimara Gas and Power: Combined Cycle Gas Turbine and Liquefied Natural Gas receiving, storage and regasification facilities. Environmental Impact Statement - Assessment of Environmental Impacts on Water Quality of Proposed Project. Report submitted to Enemalta Corporation (Final version dated 4 December 2013). Malta; Ecoserv Ltd.; unpublished report; 92 + 19pp.

Axiak, V. 2016. Addendum to: Delimara Gas and Power: Combined Cycle Gas Turbine and Liquefied Natural Gas receiving, storage and regasification facilities. Environmental Impact Statement - Assessment of Environmental Impacts on Water Quality of Proposed Project. Report submitted to Enemalta Corporation (Final version dated 4 December 2013). Malta; Ecoserv Ltd.; unpublished report, 13pp.

Ecoserv (2016). Technical statement: Addendum to assessment of environmental impacts on water quality forming part of the environment impact statement for the proposed CCGT and LNG storage and regasification plant at the Delimara Power Station, Malta. Malta; Ecoserv Ltd; unpublished report, 12pp.

Ecoserv (2021). Monitoring of floating storage unit inert gas generator discharge. Report submitted to ElectroGas Malta. Malta; Ecoserv Ltd; unpublished report, 524pp.

Joseph A Borg BSc MSc PhD CBiol FRSB FMBA FIBMS
Independent Consultant for Ecoserv Ltd

28th September 2021

Appendix Three

Marine Ecology

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Report reference number: 075-21_R
Report reference: ERSLI-150621-EGM IPPC permit renewal variations - marine ecology
Date: 28th September 2021

TECHNICAL STATEMENT

Update to the marine ecology study forming part of the environment impact statement for the proposed CCGT and LNG storage and regasification plant at the Delimara Power Station in view of IPPC permit renewal variations

Client: ElectroGas Malta Ltd.
Block D, Ta' Monita,
Piazza off St Joseph Street,
Marsaskala, MSK 1050,
Malta

PREAMBLE

Ecoserv Ltd received a request from ERSLI Consultants, acting on behalf of ElectroGas Malta (henceforth 'EGM'), operators of the Delimara Power Station's CCGT and LNG plant (henceforth 'plant'), to submit a statement of assessment of the potential impacts on marine ecology resulting from the IPPC renewal variations (henceforth 'variations') proposed by the latter company. The request is for the technical statement to be made by Professor Joseph A. Borg (hereafter 'consultant'), who served as consultant for marine ecology in relation to the Environment Impact Assessment for the plant. Specifically, the technical statement should indicate: (i) which of the IPPC permit variations are deemed to potentially affect marine ecology; and (ii) for each of the variations identified as potentially affecting marine ecology, determine potential changes to the assessment of impacts contained in the report of the marine ecology study[1] prepared as part of the Environment Impact Statement (EIS) for the Delimara Power Station same project, in Ecoserv's technical statement[2] issued in 2015 in response to proposed small modifications to the design[3] for

[1] Ecoserv (2013). Report on marine ecological studies at il-Hofra z-Zghira and Delimara, prepared for the Environment Impact Statement in connection with the proposed Combined Cycle Gas Turbine and Liquefied Natural Gas receiving, storage and regasification facilities at Delimara, Malta. Malta: unpublished report, 68pp.
[2] Ecoserv (2015). Technical statement: Update to the marine ecology study forming part of the environment impact statement for the proposed CCGT and LNG storage and regasification plant at the Delimara Power Station, Malta. Malta: unpublished report, 5pp.
[3] Proposal included modifications for the design of the jetty.

the proposed CCGT/LNG storage and regasification plant at the Delimara Power Station, and in Ecoserv's (2016) technical statements dated 1st August 2016 (Ecoserv, 2016a)[4] and 13th September 2016 (Ecoserv, 2016b)[5] concerning proposed modifications to specifications of the Floating Storage Unit (FSU) and changes to the location and mooring system of same.

The proposed variations are as follows:

B. Ship-to-Ship transfer - LNG offloading
C. Glycol expansion tank upgrade
D. Improved power supply feeder
E. Addition of FSU Boil Off Gas Attemperator
F. Improved bunding of make-up water glycol tank
G. Improved pressure control for LNG send out pumps through Kongsberg upgrade to K-chief system
H. Introduction of Oily Water Separator at Regasification Site
I. Oil Boom
J. D4 Portacabin Offices Sewage Collection
K. Installation of Chemical Stores used in plant operation/maintenance (at both generation and regasification sites)
L. Installation of office facilities
M. Installation of A/C units and updating of F gas register
N. Upgrade to reflect changes in fire suppression systems in line with regulations
O. New cooling water pump
P. Removal of AST/QAL 2 testing requirement for GT bypass stacks
Q. Cooling water mixing chamber
R. Inert Gas Generator

The present document comprises the requested technical statement in relation to assessment of the potential impacts on marine ecology of the IPPC renewal variations listed above that are deemed as being relevant within the context of possible impacts on marine ecology.

METHODOLOGY

The following documents provided by Electrogas were considered during compilation of the present statement:

1. Document titled 'IPPC permit renewal variations'
2. Document titled 'Variations on plan'

Essentially, the first document ('IPPC permit renewal variations') presents the variations listed under the Preamble section above and, for each, a brief description of the relative variation is given therein. The second document ('Variations on plan') presents drawings that are relevant to the variations and help one gain an understanding of the layout of the area / structure / source where the variation is located.

[4] Ecoserv (2016a). Technical statement: Update to the marine ecology study forming part of the environment impact statement for the proposed CCGT and LNG storage and regasification plant at the Delimara Power Station, Malta. Malta: unpublished report, 16pp.
[5] Ecoserv (2016b). Technical statement: Update to the marine ecology study forming part of the environment impact statement for the proposed CCGT and LNG storage and regasification plant at the Delimara Power Station, Malta. Malta: unpublished report, 5pp.

APPRAISAL

Examination of the description for each of the proposed variations resulted in the following short-list that are deemed relevant within the context of possible impacts on marine ecology:

- Ship-to-Ship transfer - LNG offloading
- Improved pressure control for LNG send out pumps through Kongsberg upgrade to K-chief system
- Introduction of Oily Water Separator at Regasification Site
- Oil Boom
- New cooling water pump
- Cooling water mixing chamber
- Inert Gas Generator

A brief description of each variation and assessment of the potential impacts on marine ecology of the respective variation, follows.

Ship-to-Ship transfer - LNG offloading (B)

At times, it will be necessary to offload a volume of LNG stored in the floating storage unit 'LNG Armada Mediterrana', onto an LNG carrier. Essentially, such offloading operation from the FSU to a LNG carrier (which is the same one that visits Delimara to replenish the FSU's LNG reserve), comprises a reverse process to that wherein LNG is transferred from the carrier to the FSU. Depending on the state of the LNG visitor cargo, three different operations are foreseen; gassing up, cooling down and offloading of small volumes of LNG.

The HAZOP[6] conducted by OSL consulting engineers in November 2020 (OS-0928-OSLI-HRP-0001-D00) concluded that each of the offloading operations has been risk assessed within the HAZOP workshop. The HAZOP is conducted on the basis that there will be simultaneous send out to shore. The existing Safety Studies and other operational permits for the Project did not consider any reverse flow to any visitor cargo; however, the FSU systems in place are designed for it, as it is a common shipping operation. This new operation requires a minor software modification to the ESD Cause & Effect matrix and there is a Management of Change (MOC) which the designer company will implement. All procedures will be followed, and safety and security arrangements will be the same as any other ship-to-ship transfer operation that is regularly carried out at the terminal.

The main source of potential impact of this operation on marine ecology has been identified as **spillage of LNG to the marine environment** during the operational phase. However, the effects of introduction of LNG to the marine environment on marine biota and habitats are not known. Furthermore, any potential adverse effects from spillage of LNG will depend on the amount released, which in turn will depend on preventive measures and on response time in the eventuality of an accident. In the original assessment of impacts on marine ecology (Ecoserv, 2013), the overall level of impact of potential LNG spillage on marine ecology was deemed **low**. Given that the HAZOP will be in place and that all procedures will be the same as any other ship-to-ship transfer operation, the proposed 'Ship-to-Ship transfer - LNG offloading' variation is deemed **to not result in any changes to the impacts on marine ecology** as already detailed for this aspect in Ecoserv (2013), and where relevant in Ecoserv (2015; 2016a; 2016b).

[6] Hazard and operability study.

Improved pressure control for LNG send out pumps through Kongsberg upgrade to K-chief system (G)

This variation is related to the previous variation (B) 'Ship-to-Ship transfer - LNG offloading' in the sense that the stated pumps will be located on the FSU and will serve to pump LNG to the Regassification Site. The proposed variation will result in better pressure control of the LNG pumps, which should therefore result in reduced risk of LNG spillage resulting from some malfunction involving pressure control in the system that conveys the LNG to the Regasification Unit.

As for the previous variation (B), the main source of potential impact of this component on marine ecology is **spillage of LNG to the marine environment** during the operational phase. In the original assessment of impacts on marine ecology (Ecoserv, 2013), the overall level of impact of potential LNG spillage on marine ecology was deemed **low**. Since the present variation comprises an improvement in pressure control, it should reduce further the risk of LNG spillage, and hence result in a lower level of potential adverse impact on marine ecology. Therefore, the proposed variation 'improved pressure control for LNG send out pumps through Kongsberg upgrade to K-chief system' is deemed **to not result in any changes to the impacts on marine ecology** as already detailed for this aspect in Ecoserv (2013), and where relevant in Ecoserv (2015; 2016a; 2016b).

Introduction of Oily Water Separator at Regasification Site (H)

EGM describe this variation as representing installation of an above-ground oil water separator in the regasification area, the purpose of which is to receive wastewater generated from the operational activities of air compressors. The effluent is monitored and if compliant it is discharged at Discharge Point 1[7]; see Figure 1.

Monitoring of discharges to sea, including in the vicinity of Discharge Point 1, undertaken by Ecoserv Ltd (Ecoserv, 2021) in April 2021, indicated no alteration of water quality in the vicinity of the plant and FSU, including during the FSU's pre-tank and post-tank inerting phases. Specifically, Ecoserv's (2021) report concludes: *"The main conclusion from the present monitoring session is that the activities related to the deaeration of the IGG tank, during both the pre-tank inerting and post-tank inerting phases, have not had any appreciable effects on / did not result in changes to water quality, with respect to the parameters considered in the present assessment."*

The main source of potential impacts on marine ecology concerning this variation **arises from discharges to sea** during the operational phase. Specifically, the possible introduction of toxic substances and contaminants potentially present in the wastewater may have acute or chronic effects (see Ecoserv, 2013) on the marine flora and fauna, and on engineer species such as seagrasses that are benthic habitat builders. However, installation of an oily water separator is expected to result in reduced levels of potential contaminants / toxic substances that may be present in the discharged effluent, such that potential adverse impacts on the marine environment, and hence on marine ecology, are further reduced compared to the absence of oil separators. In the original assessment of impacts on marine ecology (Ecoserv, 2013), the overall level of impact of discharges to the marine environment was deemed **low** during normal operational phases and **moderate** to **high** in the case of a major accident. Considering that the proposed variation is expected to lead to an improvement in quality of the discharge at Discharge Point 1, the proposed variation 'Introduction of Oily Water Separator at Regasification Site' is deemed **to not result in any changes to the impacts on marine ecology** as already detailed for this aspect in Ecoserv (2013), and where relevant in Ecoserv (2015; 2016a; 2016b).

[7] In the document titled 'IPPC permit renewal variations', this is erroneously indicated as Discharge Point 6.

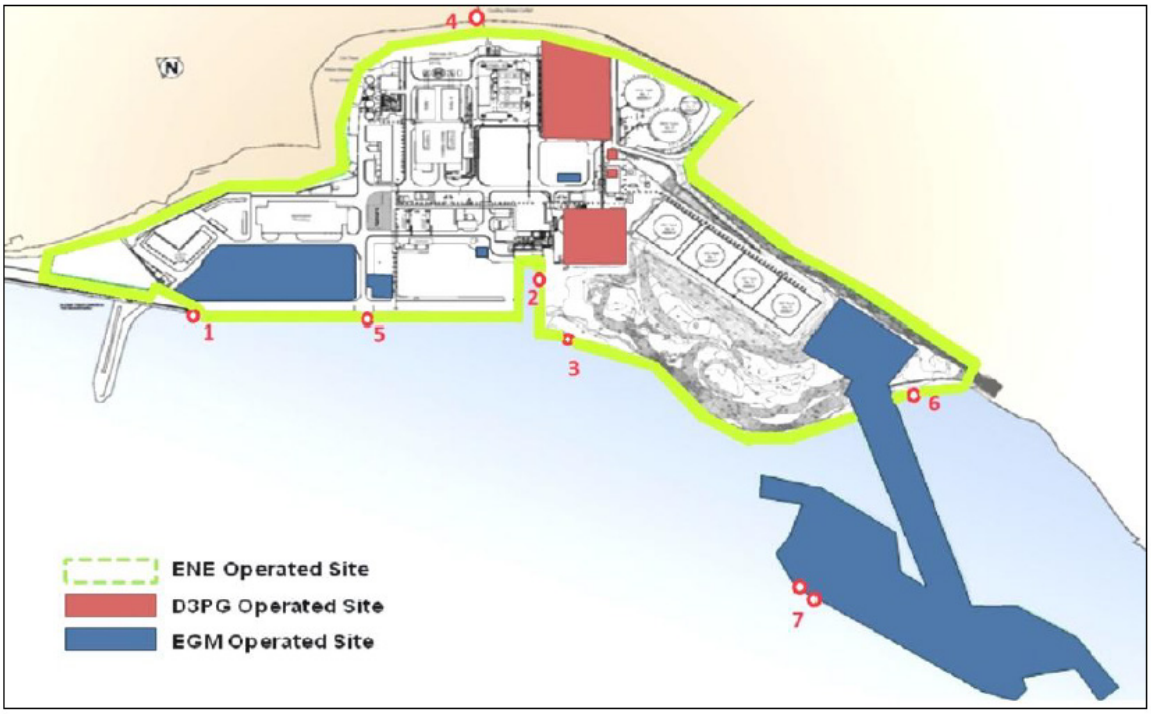

Figure 1: Effluent discharge points (1, 4, 6 and 7) pertaining to EGM's operations. Discharge Point 1: Runoff from EGM's Operated Site; Discharge Point 4: Cooling effluent discharged at il-Hofra z-Zghira; Discharge Point 6: Effluent from the Regassification Unit; Discharge Point 7: Effluent from the FSU. Discharge points 2, 3 and 5 do not relate to EGM's operations.

Oil Boom (I)

EGM have installed a 300-meter oil boom on the quay adjacent to the Delimara 4 portacabin offices. The oil boom allows for quick and efficient deployment in case of an oil spill within the adjacent sea area. Since the oil boom is located on land and will only be deployed at sea in the eventuality of an oil spill, in which case the latter is deemed to potentially have a much higher level of impact on marine ecology than deployment of the boom and would need specific assessment when and if a spill occurs, this variation 'oil boom' is deemed **to not result in any changes to the impacts on marine ecology** as already detailed for this aspect in Ecoserv (2013), and where relevant in Ecoserv (2015; 2016a; 2016b).

New cooling water pump (O)

EGM have installed a new main cooling sea water pump that is identical to the one already in use and which is included in the existing IPPC permit. The new pump was installed following freeing up of physical space in the area as a result of D1 decommissioning, and is aimed at increasing reliability of the steam turbine through redundancy to improve security of supply. Only one of the pumps is operational at any given time; hence installation of the second pump provides backup and ensures continuity of operations, should there be issues with either of the two pumps. Installation of the second pump does not result in any changes to the volume and physico-chemical characteristics of the thermal effluent released at Discharge Point 4 (see Figure 1).

In the original assessment of impacts on marine ecology (Ecoserv, 2013), the overall level of impact of the thermal effluent at il-Hofra z-Zghira on marine ecology was deemed **low**. Given that the present variation 'new cooling water pump' will not result in changes to the physico-chemical characteristics and volume of

discharges to the marine environment, including at il-Hofra z-Zghira, it is deemed **to not result in any changes to the impacts on marine ecology** as already detailed for this aspect in Ecoserv (2013), and where relevant in Ecoserv (2015; 2016a; 2016b).

Cooling water mixing chamber (Q)

EGM installed a cooling water mixing chamber to allow connection of the D4 seawater piping to the main outfall using the D1 seawater pipes. In the meantime, the D1 plant has been fully decommissioned, such that the mixing chamber is now for the sole use of D4. Overall, such modification will not result in any changes to the volume and physico-chemical characteristics of the thermal effluent discharged at Discharge Point 4 (see Figure 1).

In the original assessment of impacts on marine ecology (Ecoserv, 2013), the overall level of impact of the thermal effluent at il-Hofra z-Zghira on marine ecology was deemed **low**. Given that the present variation 'cooling water mixing chamber' will not result in changes to the physico-chemical characteristics and volume of discharges to the marine environment, including at il-Hofra z-Zghira, it is deemed **to not result in any changes to the impacts on marine ecology** as already detailed for this aspect in Ecoserv (2013), and where relevant in Ecoserv (2015; 2016a; 2016b).

Inert Gas Generator (R)

EGM refer to the Inert Gas Generator (IGG) on board the Floating Storage Unit, as described in section B1.2 Non-Technical Description of the original IPPC application (prepared by AECOM on behalf of ElectroGas Malta), and other supporting documentation. During the FSU Class Certification and Environmental Management System auditing processes, it was noted that the IGG system is not clearly referenced in the IPPC permit issued. EGM clarifies that the IGG on board the FSU is a Sasakura Moss engine which operates at a 50% load at a rated thermal input of 7.2 MWth to generate inert gas through combustion of good quality fuel oil, to generate dry air having limited oxygen content after treatment through cleaning and cooling apparatus. Two main outputs as a result of this process are the air output into the tanks, that are eventually released to the air after use and the sea water outlet from the scrubbing system. The effluent output from the IGG is represented by Discharge Point 8 in Figure 2. Monitoring of discharges to sea, including in the vicinity of Discharge Point 8, undertaken by Ecoserv Ltd (Ecoserv, 2021) in April 2021, indicated no alteration of water quality in the vicinity of the plant and FSU, including during the FSU's pre-tank and post-tank inerting phases. Specifically, Ecoserv's (2021) report concludes: *"The main conclusion from the present monitoring session is that the activities related to the deaeration of the IGG tank, during both the pre-tank inerting and post-tank inerting phases, have not had any appreciable effects on / did not result in changes to water quality, with respect to the parameters considered in the present assessment."*

In any case, the present clarification does not entail any operational change to the IGG; hence the present variation 'inert gas generator' is deemed **to not result in any changes to the impacts on marine ecology** as already detailed for this component in Ecoserv (2013), and where relevant in Ecoserv (2015; 2016a; 2016b).

Figure 2: Effluent Discharge Point 8 (IGG).

Taking the above into consideration, overall, it is deemed that the IPPC variations described above:

(i) will not result in any changes to the impacts on marine ecology as already detailed for the related aspects in Ecoserv (2013), and where relevant in Ecoserv (2015; 2016a; 2016b);

(ii) will not result in any different impacts on the ecological status of MTC107 other than those already detailed in Ecoserv (2013), and where relevant in Ecoserv (2015; 2016a; 2016b);

(iii) do not call for any different mitigation measures other than those already detailed in Ecoserv (2013), and where relevant in Ecoserv (2015; 2016a; 2016b).

REFERENCES

Ecoserv (2013). Report on marine ecological studies at il-Hofra z-Zghira and Delimara, prepared for the Environment Impact Statement in connection with the proposed Combined Cycle Gas Turbine and Liquefied Natural Gas receiving, storage and regasification facilities at Delimara, Malta. Malta; Ecoserv Ltd; unpublished report, 68pp.

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Ecoserv (2016a). Technical statement: Update to the marine ecology study forming part of the environment impact statement for the proposed CCGT and LNG storage and regasification plant at the Delimara Power Station, Malta. Malta; Ecoserv Ltd; unpublished report, 16pp.

Ecoserv (2016b). Technical statement: Update to the marine ecology study forming part of the environment impact statement for the proposed CCGT and LNG storage and regasification plant at the Delimara Power Station, Malta. Malta; Ecoserv Ltd; unpublished report, 5pp.

Ecoserv (2021). Monitoring of floating storage unit inert gas generator discharge. Report submitted to ElectroGas Malta. Malta; Ecoserv Ltd; unpublished report, 524pp.

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Independent Consultant for Ecoserv Ltd

28th September 2021

Appendix Four

Noise

Acousti-Cal Consultancy

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4th October 2021

Evaluation of IPPC Permit Variations for
Delimara 4 (Electrogas) with regards to noise and vibration.

We have been asked to review variations on the Delimara 4 site vis-à-vis IPPC permitting with regards to noise and vibration. Having evaluated the variations it has been established that the variations do not change anything from what was considered during the EIA and mitigation process at permitting stage.

Below is a list of the variations presented by Electrogas, the respective positions on the Delimara site, and the reason why the said variation would not change emissions within the terms of noise and vibration for DPS4.

This is a list of the variations supplied, named according to the site locations in Figures on the following pages:

B. Ship-to-Ship transfer - LNG offloading
C. Glycol expansion tank upgrade
D. Improved Power Supply Feeder
E. Addition of FSU Boil-Off Gas Attemperator
F. Improved bunding of make-up water glycol tank
G. Improved pressure control for LNG send out pumps through Kongsberg upgrade to K- chief system
H. Introduction of Oily Water Separator at Regasification Site
I. Oil Boom
J. D4 Portacabin Offices Sewage Collection
K. Installation of Chemical Stores used in plant operation/maintenance (at both generation and regasification sites)
L. Installation of office facilities
M. Installation of A/C units and updating of F gas register
N. Upgrade to reflect changes in fire suppression systems in line with regulations

O. New cooling water pump

P. Removal of AST and QAL 2 testing requirement for GT bypass stacks

Q. Cooling water mixing chamber

R. Inert Gas Generator

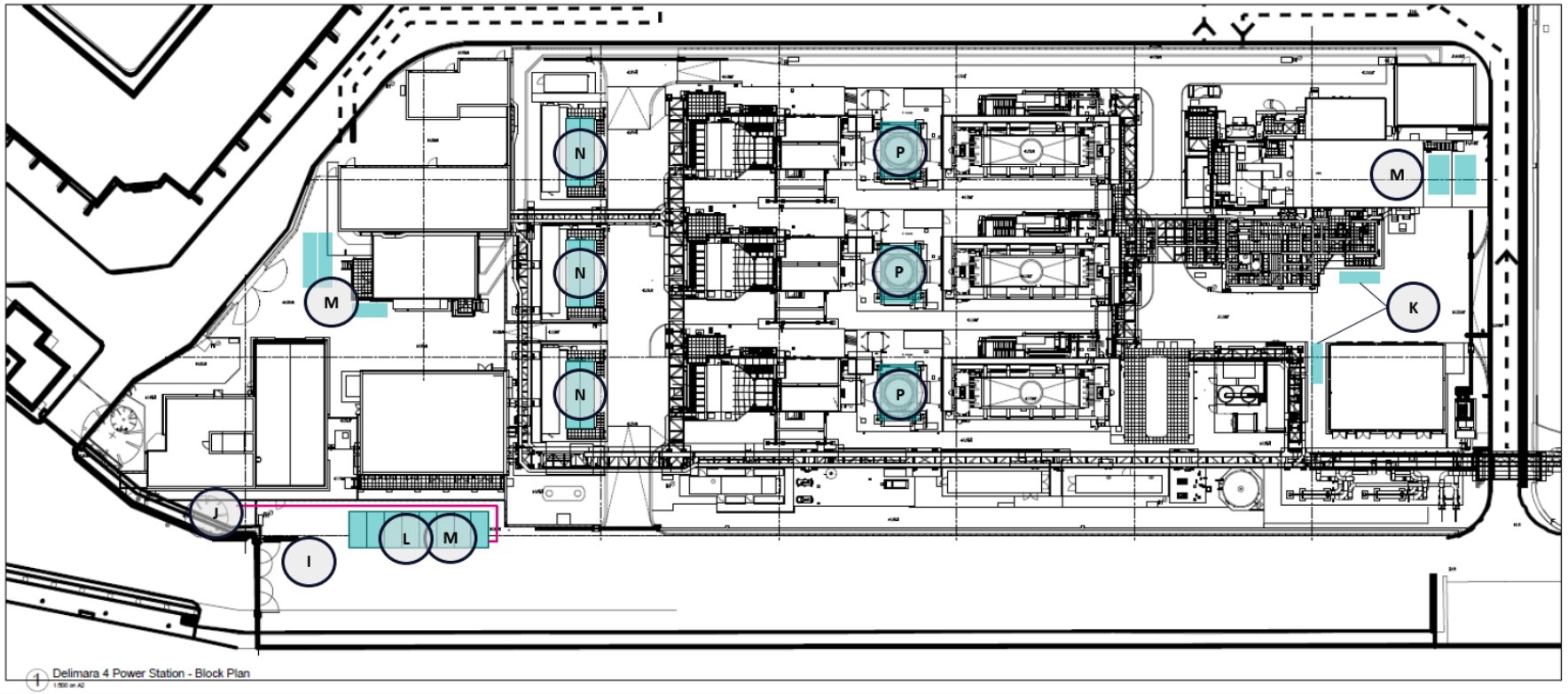


Figure 1 Variation locations on the Electrogas site.

Delimara Power Station

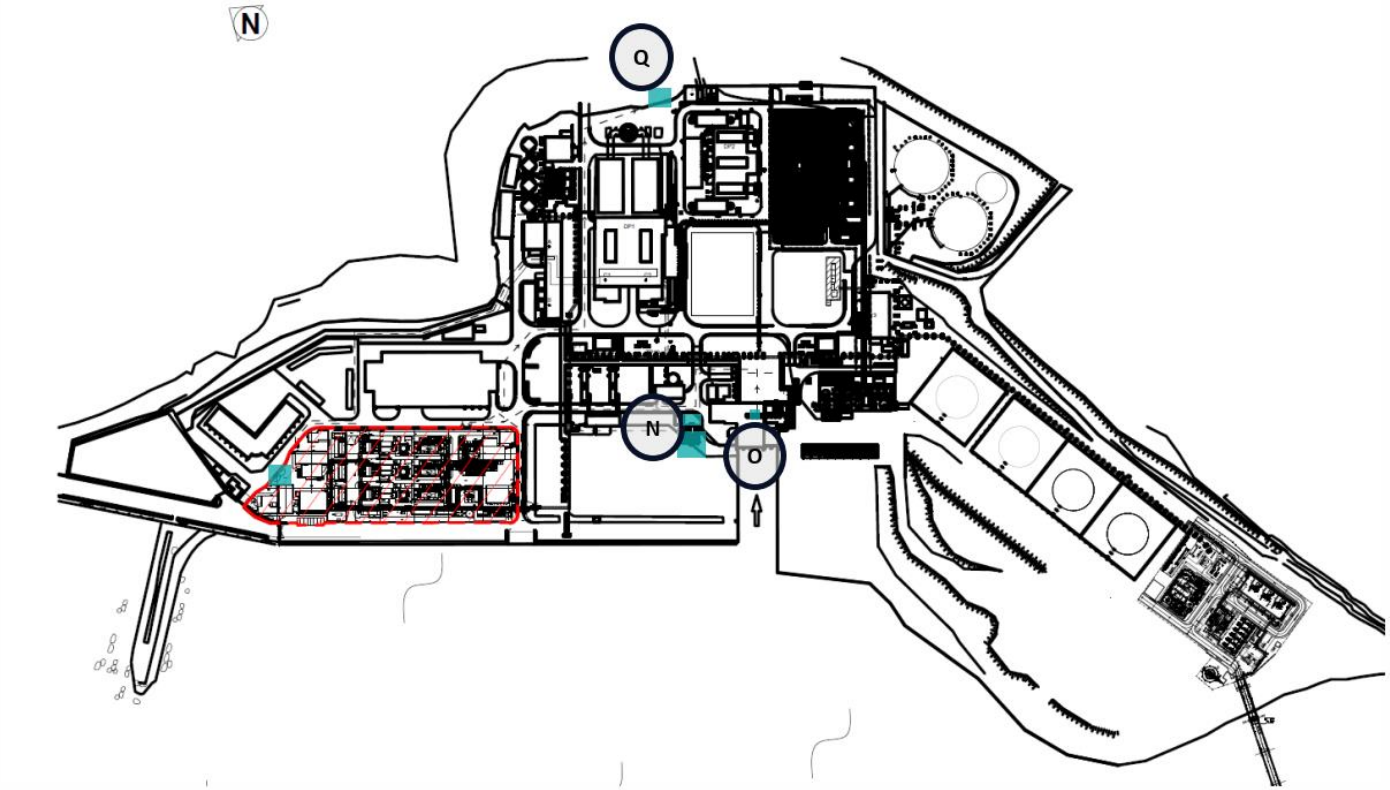


Figure 2 Other variation locations on the Delimara site.

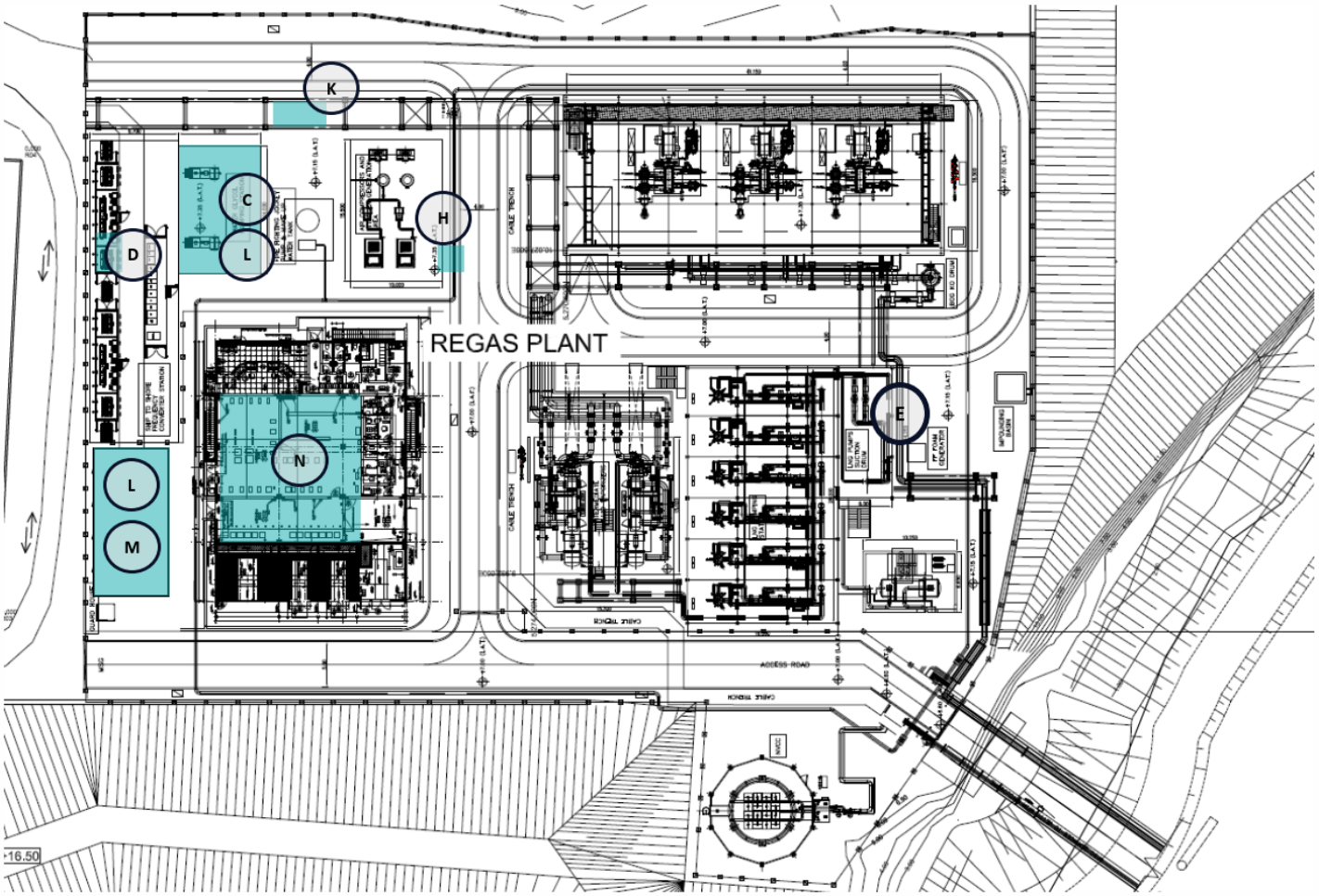


Figure 3 Variation locations on the Re-gas site.

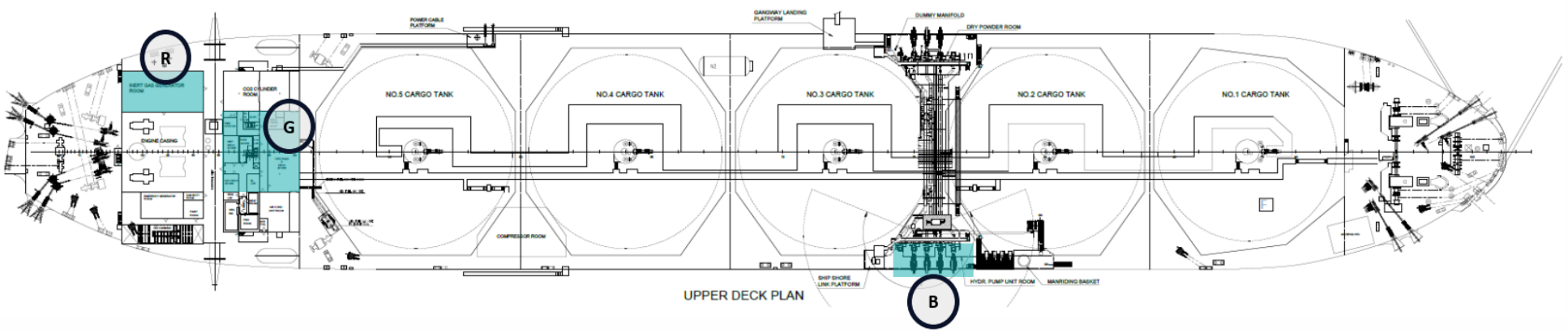


Figure 4 Variation locations on the FSU.

These are the comments with regards to each individual variation.

B. Ship-to-Ship transfer - LNG offloading

The LNG offloading is using the same apparatus as an FSU loading operation; hence it changes nothing to the present emissions.

C. Glycol expansion tank upgrade

This is a passive component and as such has no noise emissions.

D. Improved Power Supply Feeder

This is a passive component; it is also buried and as such has no noise emissions.

E. Addition of FSU Boil-Off Gas Attemperator

This is not an external noise source and as such changes nothing in the emissions.

F. Improved bunding of make-up water glycol tank

No noise generation and as such changes nothing from the present location.

G. Improved pressure control for LNG send out pumps through Kongsberg upgrade to K- chief system

The K-Chief 700 is primarily a standalone system that covers all important functions onboard a vessel, such as: Power management, Auxiliary machinery control, Ballast/bunker monitoring and control, Cargo monitoring and control.

It is a control system which changes nothing in noise emissions.

H. Introduction of Oily Water Separator at Regasification Site

This is a passive component and as such has no noise emissions.

I. Oil Boom

This is a passive component and as such has no noise emissions.

J. D4 Portacabin Offices Sewage Collection

This is a passive component and as such has no noise emissions.

K. Installation of Chemical Stores used in plant operation/maintenance (at both generation and regasification sites)

This is a passive component and as such has no noise emissions.

L. Installation of office facilities

This is a passive component and as such has no noise emissions. But it acts also as a barrier between other sources and across the bay.

M. Installation of A/C units and updating of F gas register

Although these are new sources, some were simulated in the original EIA. Their respective sound power levels (SWL) are small in comparison with the sources close by and will not make any changes in the far field.

N. Upgrade to reflect changes in fire suppression systems in line with regulations

This is a passive component and as such has no noise emissions.

O. New cooling water pump

This is replacing one of the pumps previously serving Phase 1. Although it is a noise source it was already considered in the EIA and it will not be in operation i.e., it is in standby mode.

P. Removal of AST and QAL 2 testing requirement for GT bypass stacks

The EIA covered both the bypass and closed cycle operations. And as such changes nothing from the emissions previously evaluated.

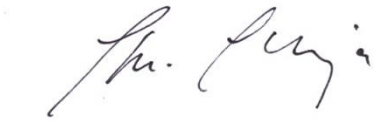
Q. Cooling water mixing chamber

This changes nothing in the far emission of the area. It should be noted that the Delimara Phase 1 has been removed from this process.

R. Inert Gas Generator

The IGG was part of the ancillaries evaluated in the EIA and is to be installed on the shoreside (Port aft) of the FSU. No changes from previous evaluation.

From the information given, from the EIA evaluation and, mitigation process prior to permitting there are no changes in the emissions to the local area – i.e., affecting the local environment or locality - in terms of noise and vibration.



…….

Christian Calleja Dip.Ind.Elec. AMIOA

Appendix Five

Environmental Risk

Dear Sir or Madam,

With reference to our report no. 02-901-188098-12141 – Revision 2 issued in Barcelona on 4th December, 2013 with the title "Project for a new LNG regasification facility to be located in the Marsaxlokk Bay - QRA PRELIMINARY REPORT", signed by Mr. Roberto Vaccari on behalf of SGS, and

Having regard to the following considerations:

I have been contacted by the project manager of the project and have received the document "IPPC permit renewal variations". This document consists of 10 pages and contains a list of variations on the IPPC permit IP/0002/07/Gi-ElectroGas Malta Ltd, identified with letters from B to R and briefly described including pictures and/or drawings.

I have selected those variation with potential impact on the COMAH requirement and the specifically on the aforementioned QRA report, namely:

- Variations B) Ship-to-Ship transfer – LNG offloading
- Variation C) glycol expansion tank upgrade
- Variation E) addition of boil-off gas attemperator
- Variation G) improved pressure control for LNG send out pumps through Kongsberg upgrade to K-chief system
- Variation K) installation of chemical stores used in plant operation/maintenance (at both generation and regasification sites)

I have proceeded to study the impact of each item on the calculations and the findings of the QRA Preliminary Report. Technical details of each item have been compared with the input data used for the QRA.

I had already considered in the cited study the potential for minor changes to take place within the development of the project, from a preliminary phase to the detailed project, stating that minor changes in the input data used for the calculation will not affect the final result (pages 31-32 of 88).

I had the opportunity to discuss with ElectroGas Ltd. representatives on the variations affecting the validity of the cited QRA.

I hereby declare that:

The impact of each one of the selected references is as follows:

- Variations B) Ship-to-Ship transfer – LNG offloading: considering the results of the studies compiled by ElectroGas Ltd, SGS foresee no impact on the overall risk, provided that the number of cargo calls remains below or equal to the number of calls considered in the cited QRA (a maximum of 9 operation per year with as duration of 48 hours each, delivering a total of 432 hours per year or 5% of the time).

- Variation C) glycol expansion tank upgrade: glycol doesn't fall under COMAH regulation, having no direct impact on safety.
- Variation E) addition of boil-off gas attemperator: being the attemperator a standard piece of equipment already in place at other sites, the presence of this element is already considered within the calculation of the cited QRA.
- Variation G) improved pressure control for LNG send out pumps through Kongsberg upgrade to K-chief system: the presence of this control is already considered within the calculation of the cited QRA.
- Variation K) installation of chemical stores used in plant operation/maintenance (at both generation and regasification sites): small quantities of chemicals for operation and maintenance purposes, whenever not included in the Seveso III Directive lists of hazardous substances or products, or included but in quantities not relevant in comparison with the threshold value, are admittable and considered as not able to generate a major accident.

In view of the above, the proposed changes to the project, provided that the information submitted by ElectroGas Ltd. is correct and all-inclusive and all variations are introduced in compliance with their Management of Change Procedure, are compatible with the findings and conclusions of the Preliminary QRA. Therefore, based on my best judgment, a review of the Preliminary QRA document is not required for the approval of these changes from a safety and risk perspective.

This declaration shall not constitute a modification or an extension of the conclusions and recommendations of the Preliminary QRA.

The above statement is true to the best of my knowledge and belief and I understand that it is made for the exclusive use of the Maltese Public Authority in the permitting process for the abovementioned project.

In Barcelona, September 29th, 2021

Roberto Vaccari