

**ENEMALTA CORPORATION
DELIMARA EXTENSION IMPLEMENTATION**

**Report
by the
Auditor General**

April 2013

TABLE OF CONTENTS

CONTENTS	Page
Abbreviations	4
Executive Summary	6
Chapter 1:	
Introduction	10
- Background from Tender Award to Pre Taking-over	10
- Basis for Current Investigation	15
- Details relevant to the Delimara BWSC plant	16
Methodology	17
Background Considerations	18
Chapter 2:	
Chronology of Events	20
Chapter 3:	
Faults and Damages to Plant	23
- Damage to Strainer and Steam Turbine	23
- Damage to the Flue Gas Desulphuriser Units	24
- Losses and Leakages of Coolant Water	27
- Spillage of Sodium Bicarbonate	30
- Tripped Distribution Cable	32
- Damage to the Dump Condenser	33
- Level of Emissions	34
- Comments on Faults and Damages to Plant by NAO's Technical Expert	36
Chapter 4:	
Root Cause Analysis	39
Chapter 5:	
Partial Taking Over	54
Chapter 6:	
Claims and Counter-Claims for Delay and Liability Charges	61
Chapter 7:	
Status of the Maintenance Agreement	63

Chapter 8:	
Appointment of EMC Technical Consultants DNV KEMA	65
Chapter 9:	
Allegations by the Opposition	
- Allegation of Serious Faults during Testing and Impact on Plant's Lifetime	67
- Allegation that EMC Project Team was Ordered Off Site	68
- Allegation that BWSC Locked Power Station Computers	70
Chapter 10:	
Conclusion	72
Appendices	77

ABBREVIATIONS

AG	Auditor General
BL	Bateman Litwin
BoD	Board of Directors
BWSC	Burmeister & Wain Scandinavian Contractor AS
CC	Conditions of Contract
CCGT	Combined Cycle Gas Turbine
CEMS	Continuous Emissions Monitoring System
CEO	Chief Executive Officer
CO	Carbon Monoxide
COO	Chief Operations Officer
CSEV	Combined Stop and Emergency Valve
DECC	Diesel Engine Combined Cycle
De-NOx	De-nitrification of Nitrogen Oxide Emissions
DNV	Det Norske Veritas
DoC	Department of Contracts
DPI	Dye Penetration Inspection
DPS	Delimara Power Station
D-R	Dresser-Rand
EC	European Commission
EMC	Enemalta Corporation
EPC	Engineering Procurement and Construction
ESV	Emergency Stop Valve
EU	European Union
FAT	Factory Acceptance Testing
FGD	Flue Gas Desulphuriser
FGP	Flue Gas Particulate
FMEA	Failure Mode and Effect Analysis
HFO	Heavy Fuel Oil
HoR	House of Representatives
HVAC	High Voltage Alternating Current
IPPC	Integrated Pollution Prevention and Control
ISO	International Organization for Standardisation
ITT	Invitation to Tender

KEMA	DNV KEMA Energy & Sustainability
kV	Kilo Volt
LCP	Large Combustion Plant
LI	Lahmeyer International
LNG	Liquefied Natural Gas
MAN	Maschinenfabrik Augsburg-Nürnberg Diesel SE
MEPA	Malta Environment and Planning Authority
MES	Mitsui Engineering and Shipbuilding Company Limited
MFEI	Ministry of Finance, the Economy and Investment
MFSA	Malta Financial Services Authority
MP	Member of Parliament
MPI	Magnetic Particle Inspection
MPS	Marsa Power Station
MW	Mega Watt
NAO	National Audit Office
NO _x	Nitrogen Oxide
PAC	Public Accounts Committee
PAH	Polycyclic Aromatic Hydrocarbon
OEM	Original Equipment Manufacturer
QA	Quality Assurance
QC	Quality Control
RPM	Revolutions per Minute
RfP	Request for Proposals
SBC	Sodium Bicarbonate
SMBC	Sumitomo Mitsui Banking Corporation
SO _x	Sodium Oxide
SPTSA	Spare Parts and Technical Service Agreement
STG	Steam Turbine Generator
TTH	The Test House
UK	United Kingdom

EXECUTIVE SUMMARY

The Delimara extension project has been surrounded by controversy since an offer for an electricity generating plant submitted by Burmeister Wain Scandinavian Contractor AS (BWSC) was accepted and the tender awarded in May 2009. Numerous allegations had, at the time, been put forward, including those of insider information, unorthodox changes in emission legislation mid-way during the period for the submission of offers and deviations from the original demand for tried and tested solutions to the eventual acceptance of untried combinations. Other allegations surrounded the controversial appointment of foreign consultancy firm Lahmeyer International by Enemalta Corporation (EMC), as well as allegations by one of the bidders of serious shortcomings in the tendering process and the considerable changes between tender dossier and contract signed. These had been investigated by the National Audit Office (NAO) and a report was published in April 2010.

Controversy over the project has again resurfaced during the commissioning phase, when extensive faults in the plant were alleged by the then Opposition and subsequently reported in sections of the media. The faults and damages to the plant raised concerns as to whether:

- a. It was normal for a project of this nature and entity to have so many teething problems;
- b. This implied that the plant had serious defects; and
- c. EMC acted correctly in the address of all these occurrences.

In view of the technical issues involved, NAO engaged the services of an expert adviser to assist in the investigation. NAO thoroughly investigated and reported on every fault which was brought to its attention, or that emerged during the investigation. The report reflects developments as at end February 2013, unless otherwise indicated.

The main faults and defects identified and corrective measures taken were:

- a. Leakages
One of the major problems encountered was that of leakages, or rather the excessive loss of cooling water. Although a degree of evaporative loss and possibly some small leakages were to be expected, in this case these were extensive and could not be attributable to evaporative loss. Although BWSC and the original equipment manufacturer Wartsila took several measures to identify the source of, and address the problem of leakages, this was never wholly resolved. The latest reports available at the closing-off of this investigation suggest that the problem might be due to manufacturing defects.

- b. **Damage to the Steam Turbine due to Failure of the Strainer**

The incident that caused most damage to the plant was the failure of the strainer in the steam stop valve and the consequent damage to the steam turbine. The failure was attributed to a manufacturing error, not helped by poor design, which allowed a possibly minor fault to cause major damages. The strainer was re-designed and replaced. The steam turbine was also re-built and re-commissioned. No other problems have since ensued.
- c. **Rupture of Filter Bags**

When the plant was operated in the first test run, a number of filter bags in the abatement system started to fall. This was blamed on the speed of the exhaust. The system was redesigned and the problem seemed to have been addressed until a rise in emissions was observed and a number of torn filter bags was discovered. To solve this problem BWSC decided to cap these bags, in effect making them redundant. This did not appear to affect emission levels since data for the months of January, February and March 2013 indicated that emissions of dust were well within limits.
- d. **Damage to the Dump Condenser**

The dump condenser developed cracks in its internal paintwork with clear signs of corrosion quite early on. EMC insisted for a permanent solution and BWSC decided to redesign the dump condenser from a horizontal unit to a vertical one. The new dump condenser is expected to be delivered in June 2013. The considerable delay in the replacement of the damaged dump condenser seems unwarranted.
- e. **Failure of the Limit Switch on Silo**

The failure of the limit switch on one of the silos containing sodium bicarbonate caused the spillage of a considerable quantity of this substance which, being in powder form, ended up covering a large area around the silo. However, no real damage was caused by the spillage. The limit switch was since reset in a lower position to prevent similar occurrences.
- f. **Failure of Steam Valve to Open Fully**

In December 2012, the steam stop valve on the turbine failed to open fully. Although not necessarily a major fault, this took longer to repair due to the delay in sourcing the replacement part.
- g. **Breaking of Gear Wheel on the Flue Gas Desulphurisers (FGDs).**

According to EMC this was due to the sodium bicarbonate powder in the FGD units which solidified on absorbing water while the plant was on shutdown following the damage to the steam turbine. This seemed to be the result of a lack of proper knowledge in operating the FGDs at the time, and therefore should not reoccur.

h. Level of Emissions

Although there were no problems with emission levels of dust, SO₂ and CO, there is a problem with the DeNox system. NO_x values exceeded the limit on several occasions, particularly for stack B, and the situation does not seem to be improving. There also seems to be a discrepancy between the diurnal and monthly values for NO_x. EMC was not in a position to explain these discrepancies and had contacted BWSC to clarify the matter. Moreover, contrary to the conditions of the IPPC permit, emission data was not being published on-line. Following interventions by NAO, data as from December 2012 was made available on EMC's website. Although outside the scope of this investigation, NAO questions why MEPA failed to monitor requirements that it itself had established when issuing the IPPC permit. Neighbouring local councils, who initially were vociferous about a plant running on heavy fuel oil, were also conspicuously missing in their non-insistence of having emission data made available to the public.

Through parliamentary interventions, the Opposition had alleged that the damages to various components of the plant, resulting from faults and failures during the testing phase, would have a long-lasting effect in that these impinged negatively on the expected life of the plant. On the basis of the technical advice obtained, NAO opines that the claim of a compromised plant lifetime cannot be substantiated.

NAO also investigated other breaches that were alleged by the Opposition, namely:

- a. that at various instances during the implementation phase, BWSC personnel ordered EMC's project team members off site; and
- b. that BWSC personnel had locked the plant's computer systems, effectively disabling the power station extension, because of a dispute with EMC over the testing procedure.

In view of EMC's version of events and the substantiating evidence produced, the allegation concerning the project team ordered off site is plausible in that, while the allegation was not totally discredited, clarifications as to who was instructed off site and the reasons for such action were provided. Furthermore, EMC insisted that the Corporation's Project Team had complete access to all activities. Nonetheless, NAO looks askance at the fact that EMC was not in a position to supply a simple official document proving the composition of a defined team of workers (in this case the Project Team).

The allegation that, following the dispute on the testing procedure, BWSC locked the power station computers is upheld by NAO. However, clarifications provided by EMC and NAO's technical expert indicate that this is normal in such circumstances and form part of damage preventive measures taken by BWSC.

Due to the dynamic environment in which the investigation was conducted, other issues emerged. For this reason, NAO widened the scope of the investigation and in

addition to the above-mentioned allegations investigated the issue of partial taking over, claims and counter-claims for delay and liability charges by EMC and BWSC, the status of the maintenance agreement and the appointment of EMC consultants DNV KEMA.

Despite the various shortcomings encountered, the major concern remains whether or not the BWSC plant has serious faults that will impinge on its lifetime. On the basis of the technical advice obtained, NAO concludes that despite the fact that not all defects have been resolved, all have or are being dealt with. Moreover, there does not appear to be enough evidence to suggest that EMC was hasty in the taking over process.

Chapter 1:

1. INTRODUCTION
2. METHODOLOGY
3. BACKGROUND CONSIDERATIONS

1. INTRODUCTION

Enemalta's Delimara extension project has been surrounded by controversy since an offer for an electricity generating plant submitted by Burmeister Wain Scandinavian Contractor AS (BWSC) was accepted and the tender awarded in May 2009. The BWSC offer was based on plant running on heavy fuel. Numerous allegations have been put forward in this respect, including those of insider information, unorthodox changes in emission legislation mid-way during the period for the submission of offers, through to deviations from the original demand for tried and tested solutions to the eventual acceptance of untried combinations. Furthermore, additional allegations surrounded the controversial appointment of foreign consultancy firm Lahmeyer International (LI) by Enemalta Corporation (EMC), as well as allegations by one of the bidders of serious shortcomings in the tendering process and the considerable changes between tender dossier and contract signed. Controversy over the project has again resurfaced at the final implementation/taking-over stages, when extensive faults in the plant were alleged by the Opposition and reported in the local media.

Background from Tender Award to Pre Taking-over

In mid-2006, EMC had issued a call for tenders for the supply of a new power generating plant, with a capacity of over 100MW, at Delimara. The tender's main objectives were to:

- improve electricity generation capacity and efficiency;
- decommission the Marsa Power Station (MPS); and
- fulfil environmental obligations.

Initially, a Request for Proposals (RfP) was issued by EMC, through the Department of Contracts (DoC), followed by an Invitation to Tender (ITT). The closing date for the submission of detailed and final bids was 4 March 2008. Although six candidates originally presented preliminary bids at the request for proposals stage of the process, only four submitted final bids - IDO Hutny Projekt AS and Bateman Energies BV (later Bateman Litwin) (BL), SOCOIN Ingenieria y Construccion Industrial SLU, BWSC and MAN Ferrostaal Power Industry GmbH. Following the adjudication and evaluation processes, the offer submitted by BWSC was selected as the winning tender.

On 26 May 2009, EMC signed the Conditions of Contract for the Supply of Delimara Diesel Power Plant by BWSC (GN/DPS 8/2006 - CT 2491/06). The contract was for the design, manufacture, supply, erection, construction and commissioning of a 144MW Diesel Power Plant at the Delimara Power Station (DPS), for a contract value of 164,950,000 Euro. An Outline Proposal for Spare Parts and Technical Support Agreement (SPTSA) was included in the contract for an additional amount of 18,000,000 Euro. The date for the completion of works was 26 months from commencement order.

Just prior to the signing of this contract, on the 13 May 2009, BL - one of the three short-listed bidders for the Delimara power station extension tender - alleged certain shortcomings in the award of the tender in question. The claims by BL mainly dealt with:

- alleged disruption to the equity of the tendering process brought about by the January 2008 legislative changes in emission limits for diesel engine fired plants;
- EMC's and DoC's failure to inform unsuccessful bidders of the tender award; and
- the limited time available to BL to submit an objection following the December 2008 decision to let the Combined Cycle Gas Turbine (CCGT) and the two Diesel Engine Combined Cycle (DECC) proposals qualify for the next phase.

The matter was brought to the attention of the Public Accounts Committee (PAC) and, at the request of three members of the Committee, the matter was referred to the Auditor General (AG). The inquiry's original terms of reference, as established at the Committee's sitting of 26 May 2009, required the AG to, essentially, assess whether:

- a. the tender procedure had been regular; and
- b. financial regulations had been adhered to.

During PAC's meeting of 23 March 2010 it was decided to add to the original terms of reference a further investigation on allegations made in a local newspaper regarding a former EMC Chief Executive Officer (CEO). This was in consequence to a formal request submitted by the latter to Chairman PAC, whereby a formal inquiry by the National Audit Office (NAO), following the publication of the article, was solicited.

NAO's report, presented to the Speaker, House of Representatives (HoR) in April 2010, concluded that:

- a. EMC failed to directly inform the unsuccessful bidders of the outcome of adjudication as clearly established in the Invitation to Tender. This gave rise to the claim made by Bateman Litwin that the appeal facility was therefore effectively denied to any bidder wishing to appeal from such decision.

- b. The selection of Lahmeyer International, through a direct order, as an independent consultant left much to be desired given that (i) it was at the time blacklisted by the World Bank; (ii) it had been previously engaged in a joint project with BWSC (one of the bidders on which LI was to draw up an independent analysis); and (iii) BWSC's local agent had also worked as Lahmeyer's agent up to 2007.
- c. Once the original tender specifications referring to emission levels were changed through the January 2008 legislative amendments, the decision by EMC and DoC to continue with the ongoing tender was questioned by the NAO. With the benefit of hindsight, it was felt that much of the controversy surrounding this tender could have been avoided had the tendering process been stopped and the tender re-issued to reflect the change in specifications.
- d. The decision by EMC to go for a prototype plant instead of the required 'tried and tested' as clearly stipulated in the Invitation to Tender was considered to have put the Corporation in a position of very high risk.
- e. DoC could have carried out the role stipulated by the pertinent legislation in a more proactive manner. This was evidenced by the fact that the Department did not vet the Request for Proposals and the Invitation to Tender documents before these were published. Lack of involvement by the DoC also occurred in the final contract, which was subject to heavy changes brought about through negotiations before this was signed.
- f. DoC's late decision to change the tendering model used, from a negotiated procedure to the three-package model, was ill-timed. This was because, by the time the bidders were made to re-submit their financial offer, EMC had already evaluated the original financial offers, negotiated these with the bidders and had even selected a preferred bidder.
- g. Once EMC realised, after the submission of the technical bids, that its original specification for tried and tested combinations of equipment that were compliant with emission legislation did not exist in the case of DECC engines, the Corporation brought on board the services of a consultancy firm, Lahmeyer International. The firm declared prototype combinations, until then untested as one complete unit, to be plausibly able to comply. Although LI's advice was qualified, EMC went ahead and declared the DECC combinations as technically compliant.
- h. NAO also questioned the undue haste with which the agreement had been signed.

NAO's report was the basis of discussion of a number of PAC sittings. During one such session, an Opposition PAC member addressed a letter to PAC Chair in which

seven concerns - described as being based on facts that emerged after the April 2010 tabling of NAO's report - were listed.

The seven concerns raised concerned:

1. the business relationships between Mitsui Engineering and Shipbuilding Company Limited (MES), MAN and BWSC;
2. EMC's 2005 loan in which the Sumitomo Mitsui Banking Corporation (SMBC) was involved;
3. KPMG as auditors of both BWSC and SMBC and EMC's assignment of financial cost analysis to the audit firm;
4. changes in legislation and technical specifications and strategic decision related to fuel type usage made during the tendering process;
5. lack of action by the authorities with respect to the involvement of subcontracting firms in illegal activities;
6. conflicts of interest; and
7. the representation of key players such as EMC, BWSC and BWSC's local representative by the same legal office.

On the basis of this letter, the Public Accounts Committee mandated NAO to take up a second investigation regarding the issues raised therein. The report of this supplementary investigation was presented to the Speaker in May 2011.

Of the seven concerns listed in the letter, two - dealing with relationships between key players and the 2005 loan taken out by EMC respectively - were deemed to bear no impact on the Delimara plant tendering process. Two other concerns - covering changes reputedly effected to accommodate a particular bidder and conflicts of interest respectively - had already been extensively reported upon in the original April 2010 report.

NAO, however, identified key issues in the remaining three concerns listed. One deficiency that transpired was EMC's consistent recourse to direct orders on an ongoing/repeat exercise and the Corporation's surpassing authorised financial capping. A second concern was the fact that in public procurement of entities dealing in water, energy, transport and postal services, public contracts regulations empowering authorities to control economic operators' participation in tendering on the basis of the latter's professional (mis)conduct were not applicable under the then prevailing legislation. Another concern was that a partner of the legal firm representing BWSC's local representative had previously been EMC's legal advisor for twenty years. This particular firm also (separately) represented BWSC locally.

Following the investigation of the concerns raised, NAO compiled a report addressing each concern individually, and came to the following conclusions:

1. The first concern dealt with relationships between MES, MAN and BWSC and was shown to bear no impact on the adjudication process.
2. The second concern addressed EMC's 2005 loan and SMBC's involvement therein. The outcome was that SMBC had advanced less than twelve per cent of the amount borrowed by EMC. Moreover, the allegation that SMBC was owned by MES was disproved through published figures of the larger of the bank's shareholders.
3. The third concern focused around KPMG's assumed role with key players BWSC, SMBC and EMC. BWSC's and SMBC's choice of external auditors was deemed to be outside NAO's mandate. However, EMC's repeated commissions to KPMG, issued on the force of direct orders and surpassing ministerial financial capping, were deemed to be indicative of a lack of transparency and equity where public procurement was concerned.
4. The fourth concern covered various significant changes that occurred during the tendering process. This supplementary report referred to the original April 2010 report in which these changes - legal, technical and administrative - had been addressed in detail. The supplementary report nonetheless relisted, in brief, the more salient of these changes.
5. The fifth concern made mention of illegal activities of which several of BWSC's sub-contractors had been found guilty. The report listed and described the two mechanisms governing the dealings with economic operators: the then prevailing legislation and the contract conditions as included in the ITT. The report demonstrated that none of these mechanisms empowered the competent authorities to eliminate sub-contractors on the grounds of illegal activities and/or professional misconduct. This was considered to be a lacuna.
6. The sixth concern spoke of conflicts of interest. In this instance, the supplementary report referred to the original April 2010 report in which the matter of EMC Chairman's conflict of interest and NAO's opinion on how such a conflict of interest was managed had been clearly depicted.
7. The seventh concern centred on the (local) legal representation of EMC, BWSC and BWSC's local representative. While the legal firm in question explained when and how such representations came into effect, NAO noted that, in the case of a particular partner of the firm, legal representation of BWSC's local representative followed after 20 years' service as legal advisor to EMC.

Although never wholly out of controversy, works on the Delimara BWSC extension progressed, initially with construction works undertaken by a local contractor, which

were subsequently followed by the delivery and on site erection of plant. In June 2012, EMC was to take over the new plant but extensions of time for completion were granted due to delays not attributable to BWSC. Taking-over was now postponed to November 2012, after a final round of testing.

Basis for Current Investigation

On 16 October 2012, photographs of a damaged turbine and of considerable dust emitted by the plant were tabled in Parliament by Opposition Member of Parliament (MP) Joe Mizzi. In his speech during adjournment, Hon. Mizzi alleged that the turbine was damaged during trial runs. He claimed that some parts had broken off during a test run and had caused considerable damage to the steam turbine. He also stated that the emissions control mechanism was leaking and that sulphur emissions from the plant were a health hazard to personnel on site. Hon. Mizzi added that the extension was not going through a full power run since four of the engines were switched off during the night, during which time BWSC engineers carried out maintenance and inspections. He also questioned whether independent experts had been engaged to verify if BWSC was achieving its contractual obligations and whether the authorities were satisfied with the reliability of the plant and its emissions control. Appendix 1 refers.

In reply to the Opposition's allegations, EMC issued a statement wherein the Corporation maintained that, before it takes over the new Delimara extension, all the plant would go through a rigorous process of testing. EMC added that following the completion of the performance and reliability tests, a fault was identified on the steam turbine stop-valve. Investigations revealed that this fault was caused by parts of the strainer, installed just in front of the steam turbine, which had dislodged. Some of these parts passed into the steam turbine causing foreign object damage. EMC claimed that, contrary to what had been reportedly stated by Hon. Mizzi, there had been no leakages of sulphur emissions from the plant. It was however, confirmed that there had been minor discharges of sodium bicarbonate (used in the abatement process) and dust from the valves of the abatement plant and the waste unloading system. With regard to the engagement of independent experts, EMC stated that it had sufficient in-house expertise to properly supervise the reliability and performance tests of the new plant. EMC maintained that there were no faults affecting the satisfactory operation of the abatement system, with emissions significantly below those stipulated by legislation. The Corporation insisted that all the plant was still under the responsibility of BWSC, who were to rectify any damage at their expense. A copy of EMC's statement, issued on 17 October 2012, is at Appendix 2.

Shortly afterwards, concerns surfaced in various sections of the media that, due to the extensive damage to the plant, the handover of the plant was going to be delayed by at least six months. On 21 October 2012, the Minister of Finance, the Economy and Investment, in his capacity as line minister responsible for EMC, issued

a statement wherein he stated that BWSC was still responsible for the plant and that Enemalta will seek redress for any resultant losses incurred by the Corporation. Appendix 3 refers. Moreover, in reply to media speculation relating to a possible partial taking over by EMC, the Corporation clarified its position in this regard, underlining its reluctance to take over part of the works since this could lead to additional operational, technical or legal risks, which at the time seemed an unavoidable consequence of partial taking over. EMC's position at this stage was that the whole of the works would be taken over following the successful completion of testing of the whole plant.

On 5 November 2012, Hon. Mizzi called at the National Audit Office and requested the Auditor General to, with immediate effect, investigate the BWSC project implementation in view of the faults that had materialised during the testing phases. Hon. Mizzi opined that an investigation was merited in this case as, contrary to what was being stated publicly by EMC, the incidences could not be considered 'normal'. During HoR's sitting (No. 517) later on that day, Hon. Mizzi gave details of his visit to NAO. Appendix 4 refers.

In his visit to the National Audit Office and during the parliamentary sitting Hon. Mizzi made two distinct allegations, namely:

- a. that damages resulting from the various faults and failures during the testing phase will have a long-lasting effect, in that they have impinged negatively on the expected life of various components; and
- b. that he was in receipt of information from a reliable source that, at various instances during the implementation phase, BWSC personnel ordered EMC's project team members off site.

On the basis of the HoR intervention, the information disclosed during Hon. Mizzi's visit to NAO and the topicality and magnitude of the concern, the Auditor General decided to investigate. The above allegations and counterclaims form the basis for this investigation.

Details relevant to the Delimara BWSC Plant

The generating plant of the Delimara BWSC extension is a combined power cycle plant made up of eight diesel engines with an aggregated electrical output of 136MW¹, an abatement system to reduce emissions, a heat recovery system and a steam turbine. The plant has two chimneys with two stacks each, used after the

¹ The plant's eight engines by themselves generate 136MW of electricity with another 13MW being generated by the steam turbine operating on waste heat from the diesel engines. The total generated power from the plant is therefore 149MW. Of this, approximately 5MW are consumed within the plant for auxiliary power - cooling water, ID fans mills, compressors, ventilation motors, lighting, etc. Thus, 144MW are exported (sold).

emissions from the fuel combustion in the engines go through the emissions abatement process. The heat recovery system is an ancillary part of the plant that takes the heat from the exhaust of the eight engines to produce steam, which in turn rotates the steam turbine to produce electricity. This system, known as combined cycle, increases the efficiency of the plant, since it is using heat that would normally be discarded. The steam turbine has the capability to produce an additional 13MW of electricity when all eight engines are in service. The main advantage of a combined cycle is derived from the situation in which the normally discarded exhaust gases are recovered and used to generate power, thereby increasing the plant's total efficiency. If all eight engines are running, this concept generates an additional 76 per cent of power generated by one of the eight engines, at no additional fuel cost. The power generating plant at the Delimara BWSC extension can be fuelled on heavy fuel oil and gasoil, and following due modification, the engines can also be fuelled on gas.

2. METHODOLOGY

This investigation was conducted in terms of Para 9(a) of the First Schedule of the Auditor General and National Audit Office Act, 1997 (Act XVI of 1997) and in accordance with generally accepted practices and guidelines applicable to the National Audit Office.

During the course of this investigation, meetings and interviews were held with senior EMC officials directly involved in the Delimara power station extension taking-over process. Whenever deemed necessary, evidence of key stakeholders was taken under oath. All allegations brought to the attention of NAO, both in person, as well as through media reports, were duly investigated and resultant findings reported upon.

All relevant documentation and information required were, to the best of our knowledge, made available to this Office. NAO findings and conclusions are based on the evaluation of such documentation and information. As is normal in inquiries of a technical nature, NAO engaged the services of a professional technical adviser with extensive knowledge and experience in the subject matter to assist this Office and to evaluate technical aspects related to the investigation. NAO's technical expert, as part of his brief, conducted a detailed fact-finding on-site visit to the Delimara BWSC plant. During the visit, the expert was accompanied by members of the NAO audit team.

Unless otherwise indicated, this Report reflects the position as at February 2013. Nonetheless, major developments after this date that directly impact findings herein are reported on.

3. BACKGROUND CONSIDERATIONS

Findings in a report drawn up by the Union of the Electricity Industry (Eurelectric) highlight a series of difficulties that island states encounter in energy provision. In the main, these difficulties stem from the insularity and size of such islands and manifest themselves as problems linked to market failures, especially those related to economies of scale, security of supply, emissions and import dependency. Due to these difficulties, island states face narrow alternatives in energy provision². According to Euroelectric, most islands still rely on heavy fuel oil (HFO) or diesel power plants, mainly because of the relative ease with which fuel can be purchased and supplied, the flexibility of the installed engines in meeting daily and seasonal fluctuations in energy demand and the lack of storage facilities. In addition, diesel engines offer efficient operation across volatile demand scenarios and have relatively low installation and maintenance costs. According to Eurelectric, this has made this technology the backbone of most island power generation systems. On the other hand, the price of HFO is set to increase further as demand grows and stricter European Union (EU) requirements for the reduction of HFO's sulphur content are enforced.

As per the Large Combustion Plant (LCP) Directive, in agreement with the EU Commission, Malta had to operate the Marsa power station for no more than 20,000 hours per energy-generating plant, between 2008 and the definitive closure by (latest) 2015³. Considering that EMC was not in a position to decommission the Marsa power station prior to taking over the Delimara plant extension and finalising the Malta-Sicily interconnector project, the Corporation opted to upgrade the Marsa plant. This upgrading, to some extent, enabled EMC to reduce the environmental impact and partly comply with EU and local environmental regulations. EMC undertook other mitigating measures to reduce emissions from the Marsa power station by operating the boilers on higher quality fuel with lower sulphur content and modifying the boiler combustion system of the plants. Since the expiration of the time limits imposed, the Malta Environment and Planning Authority (MEPA) has enforced daily fines on EMC in relation to the Marsa power station, with such fines running until the eventual decommissioning of the plant. Government has admitted that plans to shut down the Marsa plant by 2010 were not realised due to procurement delays in the commissioning of the new extension at Delimara and the cable link with EU's electricity grid. Given the alleged infringements and fine impositions, both the Delimara extension and the interconnector have become critical for EMC to cope with increasing energy demands while simultaneously meeting EU obligations.

² http://www.eurelectric.org/media/38999/eu_islands_-_towards_a_sustainable_energy_future_-_eurelectric_report_final-2012-190-0001-01-e.pdf

³ http://forum.eionet.europa.eu/x_reporting-guidelines/library/lcp_reporting/opted_out_plants/opt-outs_circaxls

In December 2010 EMC signed the contract for the design and construction of a High Voltage Alternating Current (HVAC) interconnector between Sicily and Malta, capable of continuously delivering 200MW of electricity. Initially timeframes were such that the works would be finalised by end 2013; however, delays in development permits resulted in the extension of the completion date to 2014. It is envisaged that, once finalised, the interconnector would increase the supply security, result in an improvement in the voltage and frequency stability of a small and otherwise isolated system, and achieve considerable overload capacity while reducing emissions.

Given the current scenario, if Malta is to meet the EU 2020 targets of reducing green house gases by five per cent (2005 base year) and generating ten per cent of the energy requirements through renewable sources⁴, major change in the field of energy provision is required. To this extent, apart from the Delimara BWSC extension and the Malta-Sicily interconnector, EMC is also considering a secure and economically feasible sourcing of liquefied natural gas (LNG) and an LNG pipeline.

Considerable change in this scenario is highly probable, particularly in view of the change in administration and the proposals made by the then Opposition during the run up to the general elections in March 2013. The Opposition, now in government, had laid considerable emphasis on the reduction of water and electricity tariffs and had plans for a new power plant at Delimara.

⁴ http://ec.europa.eu/europe2020/europe-2020-in-your-country/malta/index_en.htm and http://ec.europa.eu/europe2020/europe-2020-in-your-country/malta/index_en.htm

Chapter 2:

CHRONOLOGY OF EVENTS

Following the completion of the reliability run period, the Delimara BWSC extension was subject to a series of events, many of which surfaced through the intervention of Opposition MP Joe Mizzi and ensuing media coverage. In the main, these events were related to faults and damages to the plant including those to the strainer, steam turbine and filter bags, engine coolant leaks and the dispersal of sodium bicarbonate; and events relating to the ‘root cause’ analysis and repairs carried out. The following is a chronological representation of the more salient events since the commencement of plant testing in May 2012.

Year	Date	Event
2012	05-May	testing commences on the Delimara BWSC plant
	12-Jul	MEPA postpones the approval of the Delimara extension IPPC permit by ten months to July 2013
	23-Sep	EMC eyes October 2012 for Delimara BWSC extension takeover
	07-Oct	first incident involving damages to the steam turbine
	11-Oct	initial investigation by BWSC site personnel indicates that the problem is not hydraulic in nature; the sub-contractor’s (Dresser-Rand) representative is brought on site to investigate the matter
	13-Oct	EMC and BWSC cognisant of the full extent of damages sustained by the steam turbine; preparations to dismantle and ship the damaged parts to Dresser-Rand factory in the UK
	16-Oct	tabling in Parliament by Opposition MP Joe Mizzi of photographic evidence regarding BWSC plant damage and leakages of sulphur emissions
	17-Oct	EMC acknowledges damages to the plant; denies sulphur leakages but indicates spillage of sodium bicarbonate due to failure of the limit switch
	18-Oct	EMC confirms and explains damages to steam turbine
	20-Oct	declaration by Minister of Finance and EMC that Contractor (BWSC) will be held liable for the damages at the Delimara BWSC plant
	21-Oct	indications that project may be stopped for months
	23-Oct	Ministry of Finance issues Press Release regarding liquidated damages and the possible enforcement of additional penalties to cover costs incurred due to delays
	24-Oct	damaged parts of the steam turbine reaches Dresser-Rand factory in Peterborough, UK
	30-Oct	during Parliament’s adjournment Hon. Mizzi indicates that the BWSC extension has a number of problems which remain unsolved, including cooling water leakages from three of the engines
	05-Nov	repaired rotor and steam turbine parts arrive back at Delimara site
05-Nov	Hon. Mizzi requests Auditor General to investigate damages to the Delimara BWSC plant	

	08-Nov	BWSC submits to EMC a 'Steam Turbine Repair Preliminary Inspection Report' dated 6 November 2012
	17-Nov	BWSC submits 'Steam Turbine Repair Acceptance Report' dated 10 November 2012 drawn up by Dresser-Rand for BWSC; requests partial takeover of plant by EMC
	19-Nov	EMC contends that report does not provide the level of analysis, detail and conclusions in order for EMC to be certain that BWSC has taken all necessary measures to ensure that the incident causing damage to the steam turbine does not recur; refuses partial taking over of plant
	21-Nov	EMC appoints DNV KEMA to provide a critical review of the failure report of the steam turbine
	21-Nov	BWSC invoices EMC for delayed availability of construction permit, IPPC permit and delayed supply of correct specification of HFO
	23-Nov	EMC invoices BWSC for liquidated damages for delays for period 7-20 November 2012
	26-Nov	BWSC technicians lock power station computers as a result of a dispute with EMC regarding partial handing over
	27-Nov	EMC issues update on steam turbine damage stating that the turbine has been fully reassembled and has successfully passed tests at both intermediate and full loads; adds that performance testing will not proceed pending the satisfactory submission of a full analysis report from BWSC
	28-Nov	EMC invoices BWSC for additional liquidated damages for delays for period 21-27 November 2012
	29-Nov	'Root Cause Analysis Report' by Dresser-Rand dated 28 November 2012 is submitted to EMC by BWSC
	05-Dec	DNV KEMA reviews Dresser-Rand's 'Root Cause Analysis Report'
	05-Dec	EMC invoices BWSC for additional liquidated damages for delays for period 28 November-4 December 2012
	10-Dec	EMC accepts findings of the 'Root Cause Analysis Report'
	11-Dec	final performance testing commences
	12-Dec	EMC invoices BWSC for additional liquidated damages for delays for period 5-11 December 2012
	14-Dec	EMC takes over Delimara BWSC extension
	21-Dec	following a grid disturbance, the steam turbine protection system trips - malfunction in the Emergency Stop Valve (ESV) is noted; EMC lodges a warranty claim with BWSC
	23-Dec	ESV is dismantled by EMC personnel
	25-Dec	steam turbine put off barring gear
2013	04-Jan	new hydraulic cylinder and piston are delivered, accompanied by Dresser-Rand representative
	05-Jan	Hon. Mizzi alleges problems with the filter bags in the plant's abatement system
	05/06-Jan	damaged parts on ESV are replaced and repairs carried out
	07-Jan	lubricating oil and filters are re-inspected and ESV tested - operation is suspended as ESV is not functioning properly

	08-Jan	Dresser-Rand acknowledges that the ESV is not operating within the required timing; further tests are run, ESV is reopened and necessary repairs conducted
	10-Jan	ESV is reassembled in the presence of Dresser-Rand and BWSC personnel; final checks are made to verify that ESV is functioning properly
	11-Jan	steam turbine is started and synchronised to the grid at 11:00
	Jan/Feb	a number of filter bags are capped
	08-Feb	NAO site visit to Delimara BWSC plant

The cut-off date for reporting was established as that of NAO's site visit to the Delimara BWSC plant (February 2013). Nonetheless, important developments after this date that have a direct impact on the findings herein are reported on. Such instances are indicated in the Report.

Chapter 3:

FAULTS AND DAMAGES TO PLANT -

1. DAMAGE TO STRAINER AND STEAM TURBINE
2. DAMAGE TO THE FLUE GAS DESULPHURISER UNITS
3. LOSSES AND LEAKAGES OF COOLANT WATER
4. SPILLAGE OF SODIUM BICARBONATE
5. TRIPPED DISTRIBUTION CABLE
6. DAMAGE TO DUMP CONDENSER
7. LEVEL OF EMISSIONS
8. COMMENTS ON FAULTS AND DAMAGES TO PLANT BY NAO'S TECHNICAL EXPERT

1. DAMAGE TO STRAINER AND STEAM TURBINE

On 17 October 2012, extensive damage to the steam turbine of the new Delimara plant was reported in sections of the local media. The damage was first revealed in Parliament by Opposition MP Joe Mizzi the previous evening, when photographs of a damaged turbine and of considerable dust emitted by the plant were tabled. Although at the time EMC maintained that the problems encountered were normal during testing and commissioning, and that they were relatively minor issues, it was later established that both the steam turbine and the strainer had sustained significant damages.

EMC subsequently issued a statement stating that, following the completion of the commissioning and reliability testing, a fault was identified in the steam stop-valve. Investigations carried out showed that the fault was caused by parts of the strainer, installed in front of the steam turbine, which had dislodged. Some of the parts of the strainer passed into the steam turbine, causing foreign object damage. EMC added that engineers from BWSC were looking into the damage. The Corporation maintained that the power station had not yet passed to EMC pending a final round of tests. EMC added that "*preparations*" were being made by BWSC to make good for the damage in the shortest time possible. In this respect, EMC stated that, "*It has to be noted that all the plant is still under the responsibility of BWSC and they will have to rectify the damage at their expense. Enemalta has already sought legal advice on how to safeguard its interests.*"

The sequence of events related to this incident was documented in an undated and unsigned report⁵ submitted by the Corporation in reply to a query by NAO regarding the damages sustained by the BWSC plant. Excerpts of the report dealing with this incident are quoted hereunder:

⁵ This report was submitted by EMC on 14 January 2013 in reply to a query by NAO regarding damages sustained by the BWSC plant.

“The first incident involving the steam turbine occurred on the 7th October 2012 that is, after the end of the reliability run test, when during the shutting down operation of the steam turbine the stop valve failed to close fully. A manual stop valve had to be closed in order to interrupt the steam flow to the steam turbine and shut it down. An initial investigation by BWSC site personnel on 11th October 2012 indicated that the problem was not hydraulic in nature, and consequently a D-R Representative was brought on site to investigate the matter. The investigation conducted during the following days revealed that the steam line filters had burst and parts of these have lodged in the stop valve as well as within the steam turbine. Additionally the emergency stop valve and control valves were found to have impact evidence at some points. The steam turbine casing was opened up and the extent of the damage assessed. By the 13th October 2012 both Enemalta and BWSC were cognizant of the full extent of the damages sustained by the steam turbine unit. Preparations got under way to dismantle and ship the damaged parts to Dresser-Rand factory in the UK. All damaged items arrived at the Dresser-Rand factory in Peterborough on 24th October 2012. An initial report of the findings was submitted to Enemalta on the 8th November 2012.”

The repaired rotor and parts arrived back on site on 5 November 2012. Following site erection works, the steam turbine was restarted for re-commissioning on 14 November 2012. The plant was ready for performance testing by 21 November 2012. A final report, including a root cause analysis, was submitted to EMC for review on 29 November 2012. Following successful performance testing, the plant was taken over on 14 December 2012⁶.

A detailed account of these faults together with the corrective measures taken by BWSC, as well as comments on same by NAO’s technical adviser, are provided in Chapter 4 of the Report titled ‘Root Cause Analysis’.

2. DAMAGE TO THE FLUE GAS DESULPHURISER UNITS

As part of the abatement system at the Delimara BWSC extension, four flue gas desulphurisers (FGDs) were installed. The FGDs have some 580 bag filters contained inside a vertical cylinder container about 12 meters high, through which exhaust gases pass after having been dosed with sodium bicarbonate in another vertical cylinder. During this process, harmful Sodium Oxide (SO_x) is transformed into Sodium Carbonate and Sodium Sulphate, which together with particulate matter larger than 10 PM, are trapped in the filter bags. In order to run on heavy fuel oil while complying with permissible emission levels, the BWSC plant heavily depends on these FGDs.

⁶ The ‘second’ incident involving the steam turbine was the result of a grid disturbance on 21 December 2012 and unrelated to faults in the steam turbine *per se*. This incident is discussed in detail, under separate heading, later on in this Chapter - Tripped Distribution Cable.

In late December 2012/early January 2013, Opposition MP Joe Mizzi alleged, among other things, that one of the Delimara FGDs (FGD No. 2) experienced faults. According to Hon. Mizzi, the fault resulted from torn filter bags and impinged on the operations of engines No. 3 and 4, with these engines being stalled until repairs on FGD No. 2 were carried out. He added that this situation was the result of EMC's hastiness in accepting and certifying the BWSC plant. Moreover, according to Hon. Mizzi, the faults indicated that the commissioning process and reliability tests were vitiated and that the Delimara Power Station (DPS) extension had serious defects.

In view of these allegations, NAO sought clarifications from EMC regarding the faults in the abatement system. According to the Corporation, the abatement system experienced two types of faults - one relating to the agitator of the sodium bicarbonate silo, and the other to filter bags. The first fault originated due to a broken gearwheel on an actuator on the agitator of the sodium bicarbonate silo. EMC attributed this fault to a blockage within the silo when sodium bicarbonate powder in the FGD units solidified on absorbing water while the plant was on shutdown following the damage to the steam turbine. This incident seemed to be the result of a lack of proper knowledge in operating the FGDs at the time. Remedial action involved the clearing of the blockage caused by the solidified sodium bicarbonate, and the replacing of the damaged part, after which the system became operational.

The second fault resulted in the increase of dust emissions from circa $5\text{mg}/\text{Nm}^3$ to $20\text{mg}/\text{Nm}^3$ and was the result of torn filter bags in the abatement system⁷. According to EMC, some of the outer bags close to the wall of the FGD tore. Initially this happened in FGD No. 3 and all torn bags were replaced. However, when similar faults surfaced in the other FGDs, it was decided not to replace the filter bags but to have them capped. By early February 2013, a total of 52 bags had been capped in three of the four FGDs. The reason for the damage was attributed to the design of the filter bags, which consist of three cylindrical frames joined together to form a single frame, with the filter bag "dressed" over the frame. As the exhaust passes through the filter bags, these move along the frame, causing damage to the bags. EMC opined that the most likely cause of such tearing is malfunction in the lock system joining the three frames.

By early February 2013, 26, 19 and 7 filter bags had been capped in FGD No. 1, 2 and 4 respectively. No bags were capped in FGD No. 3. EMC contended that despite the capped filter bags, dust emission levels remain considerably lower than the contractual stipulated maximum of $50\text{mg}/\text{Nm}^3$. The Corporation further stated that the manufacturer deemed the plugged filter bags as redundant, with no other

⁷ Initially there was another problem with the FGDs. When BWSC first started testing, a number of filter bags fell off their outer ring due to the high velocity of the exhaust going through the bags. In order to address this problem, BWSC, through their manufacturer, made some modifications in the design, tying the outer rings of the filter bags together. This solved the problem with the FGDs right through the reliability tests, although it may have contributed to the problem of torn filter bags discussed in detail in the main text of this Chapter.

repercussions on the FGDs' filtering properties. EMC also confirmed that all FGDs were "operating correctly" and no other faults had since materialised.

In view of the technical issues involved, NAO sought the opinion of its adviser on this matter. Following the review of documentation furnished by EMC and from information obtained during an on-site visit to the BWSC plant, NAO's technical adviser opined that the capping of the filter bags should not impinge on the FGDs' performance. The claim by EMC that, following the capping of the filter bags, emissions returned to the pre-fault levels of 1-3mg/Nm³ with no increase in pressure loss across the FGDs, attested to this. According to NAO's technical adviser, these two factors were the best indicators that the system is functioning just as well with less filter bags. The capping of 26 out of 580 filter bags in FGD No. 1 resulted in a loss of only 4.5% of the original filtering capacity. Similarly, FGD No. 2 with 19 filter bags capped and FGD No. 4 with seven bags capped, experienced a reduction of 3.3% and 2.5% respectively of filtering capacity. According to NAO's technical expert, such reductions are not of concern, since "all engineering systems are over-designed" by incorporating a factor of safety in order to compensate for the degree of uncertainty originating due to factors such as approximations in calculations and uncertainties in the properties of materials used.

NAO's technical adviser was requested to comment on whether, in his opinion, the abatement system was 'over-engineered', whether this resulted in valid space being taken up, and whether this meant extra capital and/or recurrent costs to the Corporation. With regard to possible over-design, NAO's technical adviser commented that, "the design of the system is the overall responsibility of the contractor, in this case BWSC. Whether they actually designed it themselves or contracted it out, they remain responsible. Let us not forget that there is a one-year warranty in place which is the responsibility of BWSC. I would not call this over-design as 'extravagant'. Probably whoever designed the system opted for a very 'safe' design, in the light of a number of uncertainties. ... Another possibility is this was a standard design, and may have been the smallest standard design available from the manufacturer that was fit for the size of the plant installed." With regard to the taking up of additional space, the technical adviser opined that, "with a few less bags, the vertical cylinder housing the bags might have been slightly smaller in diameter, but considering that even now, there is quite some empty space around it, I do not see how a reduction in diameter would have added any valuable space." With regard to the issue of additional costs, NAO's adviser stated that we cannot really question the costs - mainly for two reasons. "The first is that ... unless it is extremely over-designed, then it would fall within the factor of safety. Also, if it was a standard design then it would have been the cheapest available option. Secondly, EMC did not pay for individual items, but an overall contract price. If anything, one can argue that any extra costs due to over-design would be borne by the contractor. In any case, I think that the cost of a few extra bags is probably insignificant compared to the overall cost of the project. Also I do not think that the reduction in bags makes a difference to recurrent costs: unless one argues that now the remaining bags have to work harder and might wear out faster."

This Office also questioned whether there is absolute certainty that the bags are not being torn due to their incompatibility with the type of emissions being produced by the engines when burning HFO. NAO's technical adviser submitted the following:

"I think we can be quite certain that the bags are not being torn due to their incompatibility with the type of emissions being produced by the engines when burning HFO. I believe that these Flue Gas Desulphurisers are the same that are used on boilers burning HFO. In fact, both the engines and the abatement system are not considered prototypes, but only their combination is. To answer this question, we must therefore consider the differences between the emissions from the engines and from the boilers. The engines will produce more NOx (which in any case is removed before the exhaust gases reach the FGD) and possibly more particulate matter than the boilers burning the same fuel, but the same SOx. None of these factors should make a difference. Also, the temperatures might be different, but the bags do not seem to have torn due to temperature problems; otherwise we would have bags tearing in the centre rather than the outside, the centre flow being hotter. Also the temperature of the flue gases when they reach the FGD is rather low, around 150-160 degrees. What might have made a difference is the pressure pulsations in the exhaust which might have caused the pressure on the bags to fluctuate in a cyclic manner eventually causing them to fail from fatigue. However, the EMC engineers assured us that the pressure pulsations in the exhaust as this leaves the engine are dampened down considerably by the time the exhaust reaches the FGD and can be considered negligible. I can well believe this, given that the exhaust must travel through the turbocharger, various ducting, the Selective Catalytic Converter (that removes the NOx), the heat recovery system and the silo where the sodium bicarbonate is added to the exhaust stream before it reaches the bags."

In view of the above, the problem of torn filter bags seems to have been adequately addressed by BWSC. EMC is also satisfied with the outcome and does not envisage similar problems in the future.

3. LOSSES AND LEAKAGES OF COOLANT WATER

On 30 October 2012, during Parliament's adjournment, Opposition MP Joe Mizzi indicated that the Delimara BWSC extension had a number of problems that had remained unresolved. Among these problems were coolant water leakages on three of the eight diesel engines (engines No. 1, 6 and 8). Despite the fact that the cylinder heads on the engines had been replaced, the problems persisted. NAO sought to verify these claims.

Requested to submit explanations, EMC forwarded to this Office a report dated 11 February 2013 through which the Corporation sought to clarify the issue. Given the complexity and technical nature involved, NAO took guidance from its technical adviser who reviewed the report and was present for a number of meetings held with EMC senior officials and at a site visit to the Delimara BWSC extension.

According to technical information supplied by EMC, the Delimara BWSC plant *“exhibits a larger cooling water circuit than a standard diesel engine plant due to the various features of the plant to reduce waste heat loss from this cooling system.”* The engines are cooled by circulated water in a semi-closed loop. For each engine, the cooling water passes through the following systems:

- the engine block and cylinder heads,
- low and high temperature charge air coolers,
- fresh water generator heaters,
- lubrication oil cooler,
- diesel oil cooler,
- jacket water pre-heater,
- central cooler, and
- pipe-work including valves, joints, expansion bellows, etc. associated with the above cooling circuit.

The cooling water is cooled in a heat exchanger that is cooled by sea-water - in other words, the cooling water takes up heat from the engine and then rejects it to the sea-water in the heat exchanger. The cooling system includes a tank that is vented to atmosphere to allow for the expansion of water, as well as for any trapped air to be vented out of the system. Because of this, the system loses some water to atmosphere through evaporation. According to EMC, the correct term to describe this is ‘cooling water loss’. This loss of cooling water is reflected in a decrease in the level of the water in the cooling water tank of each engine. Under ideal conditions, the primary cause of this loss is evaporation, as the tank is vented to atmosphere. The exact amount of water lost through evaporation depends on a number of factors, such as the difference between the temperature of the cooling water and that of ambient air as well as the relative humidity of the air. According to the Corporation, calculations based on the conditions during the test period indicated a possible evaporative loss per tank (that is, per single engine) of 6.5 litres per hour. Naturally, this amount changes under different ambient conditions, for example at a lower air temperature and a lower relative humidity, water loss through evaporation may increase. Nonetheless, there may be other possible sources of coolant losses. These include leakages in any part of the cooling circuit, as well as leakages in the combustion chambers.

Given that each engine’s expansion tank is vented to atmosphere, both EMC and NAO’s technical adviser concluded that some of the cooling water ‘leakages’ reported was the result of evaporative loss. According to NAO’s technical adviser, when the loss of water is above the level that can be ascribed to evaporation *“then there is a leakage of water which needs to be identified. The cooling water passes through a number of systems, all of which could potentially be the source of the leaks. Leakages from most of these systems would be visible and hence easily detectable. However, another source of water loss could be leakages into the engine block and cylinder heads. As long as the water does not enter the lubricating system of the engine and does not mix with oil but ends up in the combustion chamber, then*

no harm is done. Water entering the combustion chamber is exhausted together with the water produced by the combustion of fuel and the other exhaust gases.” On the other hand, *“water entering the lubrication system can damage the engine. The engines are equipped with a device that can detect if there is water in the oil, and if there is, the system automatically trips the engine, i.e. it causes the engine to stop before any damage can be done. From information supplied by EMC, it seems that this has never happened and all leakages have been attributed to water entering the combustion chamber. In fact, the chances of water seeping into the combustion chamber are much higher than water finding its way into the lubrication system. ... With everything operating properly, the only loss of water should come from evaporation in the header tank”.* According to EMC, and confirmed by NAO’s technical expert, water losses are only of concern if the lubrication oil is contaminated or if the monitoring device trips the engine, signalling that the cooling water leakage could cause damage to the engines. Should the leakage result in cooling water entering the combustion chamber, no damage is envisaged and the water is expelled as vapour with the combustion gases. Nonetheless, both EMC and NAO’s adviser agree that when the loss of water is above the level that could be ascribed to evaporation, then there is a leakage of water that needs to be identified and rectified.

From reports submitted and meetings held between NAO and EMC it emerged that engine cooling water loss, above normal evaporative loss, affected engines No. 1, 5, 6 and 8. EMC’s report titled *‘Water Loss - Diesel Engines - Delimara Power Station Extension’* indicated that water loss in engine No. 5 was due to a failed seal, while water losses in engines No. 1, 6, and 8 were the result of leakages on the cylinder heads. Extracts from a report drawn up by EMC, duly reviewed by NAO’s technical adviser, indicated that:

- The cooling water leak of about 50 litres per hour on engine No. 1 was first detected during the initial demonstration test on 18 August 2012. In order to find the fault, a number of cylinder heads were replaced during the reliability tests held in first week of October 2012. By 7 October 2012, the cooling water loss returned to a normal evaporative level (5 litres per hour).
- On 4 September 2012, engine No. 5 tripped due to cooling water ingress in one of the cylinders. Investigations carried out indicated that the leakage in this engine was caused by the rapture of a sealing ring between the engine block and the cylinder head. A drop in the exhaust temperature immediately registered this fault. The sealing ring was replaced and the cooling water loss returned to normal evaporative levels. On 11 September 2012, reliability tests for engine No. 5 commenced with all plant in operation.
- The cooling water system on engine No. 6 developed a leak on one of the cylinder heads on 27 October 2012. This fault was rectified and the loss returned to a normal evaporative rate. The engine was run and tested on the 28 October 2012.

- A cooling water leak on engine No. 8 was first noticed around mid-July 2012; this was rectified on 23 July 2012. Another leak developed on another cylinder during the first demonstration test in early October 2012. A number of cylinder heads were exchanged and final testing on 24 October 2012 revealed that cooling water loss had returned to levels attributable to evaporative loss.

Several possible reasons for leakages above normal evaporative loss exist. In the cases indicated above, since there were no visible leaks and since no evidence was found of water seeping into the oil, it was concluded that the cooling water was entering the combustion chambers. By 28 October 2012, all the engines had been repaired by changing the cylinder heads or the sealing ring. No irregularities were observed until 28 December 2012 when another abnormal water loss was detected on Engine No. 5. The symptoms were the same as those previously noted on engines No. 1, 6 and 8 and the engines' original equipment manufacturer Wartsila intended to dismantle the cylinder heads for thorough inspections and remedial action. By end March 2013 the fault remained unsolved. Engine No. 5 was, however, still in use since the leak was within a level that allowed this engine to be in service.

On 1 March 2013 BWSC submitted to EMC a copy of the Technical Statement prepared by Wartsila dated 4 February 2013 of the results of the inspections carried out on the faulty cylinder heads that had been sent for repairs to the Wartsila WIT-Genoa workshop. The technical statement gave details of the faults found which indicated that these were due to a manufacturing problem. According to NAO's technical adviser *"if this is the case then the rectification of these manufacturing defects should solve the problem"*. At the time of concluding this Report, BWSC and Wartsila were considering the replacement of all cylinder heads.

It is to be noted that despite the reported excessive coolant water losses, NAO's technical adviser found no evidence that the rate of cooling water loss was being measured and recorded. Nor was the amount of make-up water recorded in result sheets submitted by EMC.

4. SPILLAGE OF SODIUM BICARBONATE

In October 2012, the media reported comments⁸ made in Parliament by Opposition MP Joe Mizzi of failures in the BWSC plant abatement system, namely torn filter bags in the FGDs and leakages of sulphur emissions. NAO investigated these allegations, seeking explanations from EMC and consulting its technical adviser on the matter.

⁸ <http://www.timesofmalta.com/articles/view/20121018/local/Enemalta-confirms-damage-to-steam-turbine.441526>
<http://www.timesofmalta.com/articles/view/20121017/local/mp-says-power-station-extension-turbine-damaged.441471>
<http://www.maltatoday.com.mt/en/newsdetails/news/national/Enemalta-says-Delimara-turbine-will-be-repaired-at-Bwsc-s-expense-20121017>
<http://di-ve.com/national/no-health-hazard-employees-delimara-enemalta>

In clarification, it is to be noted that although both the filter bags and the sodium bicarbonate form part of the abatement system, the faults and incidents are in fact unrelated. This section focuses on the latter issue⁹.

According to media reports, Hon. Mizzi had alleged that there have been leakages of sulphur emissions from the plant resulting in a health hazard to personnel on site. On 17 October 2012, EMC issued a press release that, among other things, provided clarifications on these leakages. According to the Corporation, contrary to what was reported, there had been no sulphur emissions, but confirmed the discharge of the sodium bicarbonate used in the abatement process. EMC attributed the cause to *“dust from the valves of the abatement system and the waste unloading system.”* The Corporation added that *“these faults are being corrected and the valves are being replaced or modified.”*

In a meeting held with NAO, the Corporation provided this Office with further clarifications on the sodium bicarbonate spillage and the remedial action taken to address this problem. EMC explained that sodium bicarbonate is required to remove sulphur oxides from the exhaust. Following the combustion process, the exhaust passes through the FGDs where sodium bicarbonate is injected into the gas stream. This reacts with the sulphur oxides, transforming exhaust into sodium carbonate and sodium sulphate. Solid particles are also produced, which are then removed in the filter bags. The plant has four FGDs - one per two engines - each containing some 580 filter bags. When the bags reach their maximum capacity, the powder is first transferred into a silo and then into tanks held in shipping containers.

The waste powder dispersal occurred when this was in transit from the silo to the container. Under normal circumstances, once the tank in the container reaches capacity, an automatic limit switch halts the powder flow. However, on the day of the incident, the limit switch failed. This resulted in an overflow and the eventual dispersal of the waste powder. Augmenting the limit switch failure was the increase in flow rate. Prior to the incident, the powder was transferred from the silo to the container at a low flow rate, with this procedure taking approximately two to three hours. In an attempt to speed up the process duration to 30 minutes, EMC decided to considerably increase the flow rate. The limit switch failed on the first high flow rate attempt. EMC claimed that the high flow rate process did not represent a causation factor, but resulted in a greater volume of dispersed waste powder. EMC's claim that the high flow rate was circumstantial to the incident and not a causing factor is supported by the subsequent utilisation of the high flow rate without any reoccurrence of the incident.

Given that the automatic cut off failed to halt the flow, NAO questioned EMC on the reliance on only one limit switch. EMC confirmed that the system relies on only one automatic limit switch, adding that although such design is standard, the system also has a manual override switch. The Corporation stated that under normal conditions,

⁹ The issue of torn filter bags is discussed in detail in a previous section of this Chapter.

the system is robust enough to prevent such incidents, more so since, if need be, an operator can manually activate the emergency stop switch. Unfortunately, it did not seem to have happened this time. According to EMC, considering that this was a first time incident, the event went undetected for some time. Therefore, by the time of detection and activation of the emergency switch, some of the waste powder had dispersed.

NAO sought the advice of its technical expert on the matter and put forward a series of questions regarding the limit switch. NAO's technical adviser opined that the design should have been fail safe; however, the failure should not be deemed catastrophic to the system. Furthermore, the option of designing a system dependent on one limit switch should in itself not represent any significant concern. Neither should the flow rate impinge on the performance of the limit switch. This is supported by the fact that the limit switch failure did not recur, indicating that the flow rate does not impinge on the functioning of the limit switch. According to EMC, the limit switch was since reset in a lower position to prevent similar occurrences in future.

In view of the above, the incident of the sodium bicarbonate spillage was considered to have been a one-off incident, with no long-term negative effect on the functioning of the plant.

5. TRIPPED DISTRIBUTION CABLE

Following the 21 December 2012 energy outage experienced throughout various localities in Malta and Gozo, EMC issued a press release attributing the incident to a tripped distribution cable between the power station and the Mosta distribution centre. On 27 December 2012, Opposition MP Joe Mizzi declared that as a result of the tripped distribution cable, the steam turbine broke down. Hon. Mizzi claimed that when the turbine was again switched on, the main steam stop valve malfunctioned.

NAO sought documented clarifications from EMC relating to the cause of the trip and the following sequence of events that led to the turbine damage. The Corporation provided this Office with documents pertinent to the incident, detailing the events that led to the fault, findings made during the various stages of the disassembly of the stop valve, and the subsequent repair procedure. The following is a brief summary of the more salient points:

- On 21 December 2012, the 132kV feeder tripped while the feeder was carrying 85MW from Delimara to the Mosta distribution centre.
- The grid disturbance resulted in a severely reduced load demand, in turn resulting in an increase in system frequency. All generating units had to be

unloaded rapidly to stabilize the system. Subsequently, the steam turbine protection system tripped the steam turbine.

- Upon turbine restart attempts, the emergency stop valve (ESV) was not opening fully as per start sequence, disabling turbine restart. After several failed attempts, the operation was aborted.
- On 23 December 2012, the fault was identified as the steam turbine stop valve stopping in a partially open position instead of fully open. EMC attributed the cause of the fault to the hydraulic actuator of the steam stop valve.
- The parts required to repair the steam turbine arrived on site on 4 January 2013. Following a series of minor repairs and system testing, on 11 January 2013 the steam turbine was synchronized to the grid.

In view of the technical nature of this incident, NAO solicited the opinion of its technical expert on EMC's explanations. NAO's adviser verified the Corporation's sequence of events and attributed the time lag for sourcing the spare parts to the fact that a guarantee claim was lodged with BWSC, who in turn had to source the parts from Dresser-Rand. Considering that this order coincided with the festive period, the time lag was excusable, if not justifiable.

Given the essential nature of the service provided by EMC and the serious economic repercussions an energy outage can have, NAO questioned the option of stocking spare parts on site in order to minimize the time lag between an occurrence of a fault and the carrying out of repairs. To an extent, the answer to this depends on whether the part required is actually a consumable part subject to wear and tear that will definitely be utilised at some point in time, and other parts that are kept as emergency stock to be available when a part breaks down. The latter may lead to idle capital unless the damage materialises. NAO's technical expert deems that in the case of the ESV, a hydraulic cylinder and piston are parts that do not wear very quickly. Therefore, the decision whether to stock such parts should depend on the perceived potential risk of failure.

Although the question of what would be the ideal level of stock maintained in terms of spares is debatable, in this case the delay in repairs was partly caused by the non-availability of the parts required. Nonetheless, it can be safely stated that, in this case, the tripping incident did not result from faults in the Delimara BWSC extension.

6. DAMAGE TO THE DUMP CONDENSER

Dump condensers are used to recover large amounts of steam that may otherwise be vented to the atmosphere. The dump condenser at the BWSC plant developed cracks in its internal paintwork and clear signs of corrosion quite early on. EMC insisted for a permanent solution and BWSC decided to redesign the dump

condenser from a horizontal unit to a vertical one. The new dump condenser is expected to be delivered in June 2013, therefore no other comments could be made at this stage except that the considerable delay in the replacement of this component seems unwarranted.

7. LEVEL OF EMISSIONS

The purpose of abatement systems is to convert pollutants present in the exhaust gas with the highest efficiency. In line with the IPPC permit issued by MEPA in July 2012 *"the operator shall make emission data (most recent hourly, daily, diurnal and monthly average values and results of the most recent discontinuous measurement) publicly available via the Internet not later than 24 hours after the production of such data."* According to the IPPC permit issued for the operation of the combined cycle diesel engines at the BWSC extension, the following limits were not to be exceeded:

Dust:

55mg/Nm³ (97% of all 48 hourly mean values) and 50mg/Nm³ (calendar monthly mean values)

SO₂:

132mg/Nm³ (97% of all 48 hourly mean values) and 120mg/Nm³ (calendar monthly mean values)

NO_x (measured as NO₂):

176mg/Nm³ (95% of all 48 hourly mean values) and 160mg/Nm³ (calendar monthly mean values)

CO:

264mg/Nm³ (97% of all 24 hourly mean values) and 240mg/Nm³ (calendar monthly mean values).

The IPPC permit also set limits for emissions of ammonia, certain heavy fuel metals and PAHs. Monitoring for metals and PAHs is not required if the plant is operated on solely gasoil.

NAO requested emission data from EMC to ascertain whether the requirements of the IPPC were being met. NAO's technical adviser submitted the following with regards to the diurnal and monthly figures:

"Diurnal figures

In this case, the limits can be exceeded in 97% of all values for Dust, SO₂ and CO, and in 95% of all values for NO_x. Now for the three months of December 2012, January 2013 and February 2013, EMC has submitted 41 values per stack. i.e. 41x4 = 164 values in total. I understand this to mean that the limits can be exceeded in 3% of

the values for dust, SO₂ and CO and 5% for NO_x, namely in 3% of 164 = 5 instances for the former and 5% of 164 = 8 instances for the latter.

From the data submitted, all the measured diurnal values for dust and SO₂ are below the limit of 55 and 132 respectively.

For CO, there is only one diurnal value of 310 that is above the limit of 262. The IPPC permit allows 3% (or in this case 5 values) to exceed the limit, hence the CO values are still within the permit. Actually, in the case of CO, the permit sets the percentage for 24 hour averages rather than 48 hours. An inspection of the hourly data shows that on 9 December, there was a high incidence of CO which caused the diurnal figure for 8/9 December to be high. The hourly averages for the rest of December are quite low, indicating that this was an isolated incident.

For NO_x, there are no problems with the values for stacks A, C and D with all these values being within the limit. On the other hand, the values for stack B exceed the limit in nine occasions when the 95% rule allows eight. There is clearly a problem with the DeNox system of stack B. Of these nine occasions when the NO_x was above the limit, three occurred in December, one in January and five in February; the situation is not improving.

Monthly figures

Reviewing the monthly figures, we can see that the values for CO never exceed the limit of 240 with the highest monthly average being 128.8 on stack A in December 2012. It is interesting to note that the values are showing a decreasing trend on all stacks. However, one would not expect further decreases.

The monthly averages for SO₂ are also all well within the limit of 120 with the highest value measured as 95.3.

Dust is also within limits (55) for the monthly averages, with the highest value measured as 16.5.

For NO_x, the monthly averages show some problems. The limit in this case is 160. The figures for stack A show that this figure is exceeded in December (185.5). Stack B exceeds the limit in December (212.4) and February (211.0). Stack C also exceeds the limit in December (176.4) and February (173.3). Stack D is the best of the four with only one figure that is on the limit (160.8).

It is strange that the monthly averages exceed the limit in the case of stacks A and D, since the diurnal figures for these stacks are well below both limits, i.e. the limit of 176 for the diurnal averages and 160 for the monthly averages. Not so for stack B, where the diurnal figures clearly indicate that there is a problem. This lack of apparent lack of co-relation between the diurnal and monthly figures was discussed with officials of EMC on 8 April 2013. These officials confirmed that the averages are

computed automatically by the instrument itself. In a subsequent communication, EMC submitted a report (dated 16/4/2013) of an inspection regarding this discrepancy. They conclude that:

'Further analysis of the diurnal readings showed that the CEMS when calculating the average diurnal reading is not taking into consideration emissions values that are higher than 150mg\Nm³. This is not the case for the derivation of the daily average and monthly average readings, which take into consideration all emission values. BWSC have been contacted to investigate and clarify the matter.'

Conclusions

One can conclude that these values indicate that there are no problems with emissions of dust, SO₂ and CO. It is interesting to note that all dust values are well within limits, indicating that the problems experienced with some torn filter bags has not resulted in any excessive emissions of dust. The analysis submitted by NAO regarding the discrepancy between diurnal and monthly figures shows that the diurnal figures are not correct whereas the monthly figures are. This means therefore that the following exceedances are correct:

*Stack A shows the limit is exceeded in December (185.5);
Stack B exceeds the limit in December (212.4) and February 211.0);
Stack C also exceeds the limit in December (176.4) and February (173.3);
Stack D is the best of the four with only one figure that is one the limit (160.8).*

Clearly there is a problem with the DeNox system."

Further to the problem of NOx emissions highlighted above by NAO's technical adviser, it is to be noted that, contrary to the conditions of the IPPC permit, emission data was not being published by EMC. Following interventions by NAO, data as from December 2012 was made available on EMC's website on the link <http://www.enemalta.com.mt/emissions/#>. Although not directly related to this investigation, NAO questions why MEPA failed to monitor requirements that it itself had established when issuing the IPPC permit. Neighbouring local councils, who had initially made a ruckus about a plant running on heavy fuel oil, were also conspicuously missing in their non-insistence of having emission data made available to the public.

8. COMMENTS ON FAULTS AND DAMAGES TO PLANT BY NAO'S TECHNICAL EXPERT

NAO sought to obtain the opinion of its technical expert on the following key issues:

- a. Is it normal for a project of this nature and entity to have so many teething problems?

- b. Does this imply that the plant has serious defects?
- c. Has EMC acted correctly during all these occurrences?

With regard to question of what could be considered as normal teething problems, NAO's technical expert opined that *"one expects any project of a certain entity to have a number of teething problems. It is difficult to say what is normal and what is not"*. However, summarising all major faults that surfaced during this investigation, he concluded that:

"Leakages. This may well have been the most serious problem encountered during commissioning. Although not fully solved by the time of finalising this report, it seems that Wartsila are well on the way to do so.

Strainer valve. A minor defect that caused considerable damage. Fault should not recur as strainer has been redesigned much more robustly.

The dump condenser is being replaced with one of a new design and we have yet to see the effectiveness of the new design.

The rupture of the filter bags also seems to have been solved successfully.

Vibrations¹⁰ were never an issue, while the problems caused by the failure of the limit switch on the sodium bicarbonate silo, the failure of the steam valve to fully open after an outage caused by a distribution fault outside the system, and the breaking of a gear wheel on the FGD units were minor ones."

Requested to comment on whether, in view of the faults and damages that came to light, the plant had serious defects, NAO's technical expert stated that *"it cannot be said that the plant has serious defects. All defects, whether major or minor, have or are being dealt with. ... So, all in all, one can safely say that it the plant had some major defects, these have or are being sorted out and therefore the plant does not have serious defects"*.

Asked whether, in his opinion, EMC acted correctly during project implementation, NAO's technical expert maintained that *having gone through all the documentation submitted, the answer to this question is that EMC acted correctly all through the installation and commissioning phase of the project. The contract allowed for partial take-over which would have meant that EMC could start benefitting from the higher efficiency of the new plant as compared to the existing older plant. But EMC refused to do so in order to put pressure on BWSC to resolve the problems in a more timely manner. It seemed that this strategy worked as the steam turbine, in particular, was repaired in a very short time. Moreover, in order to safeguard its assets, EMC even engaged well-known Dutch consultancy firm DNV KEMA to confirm acceptance of the*

¹⁰ The problem of vibrations was not discussed in this Report since at the outset it was considered a minor issue bearing little consequence on the successful, or otherwise, implementation of this project.

repair of the steam turbine and also confirm that the acceptance tests were carried out satisfactorily. On all other issues, EMC similarly took a hard stance against BWSC, insisting with the contractor that all defects are repaired to the highest possible standards”.

NAO sought to identify and assess all major faults and defects that ensued during the implementation of this project. In view of the technical aspects involved, this Office obtained expert opinion on all damages to the BWSC plant that came to light during this investigation. This Office concurs with the conclusions of its technical adviser.

Chapter 4:

ROOT CAUSE ANALYSIS

In October 2012, extensive damage to the BWSC plant was reported in various sections of the media and photographs of a damaged turbine and of considerable dust emitted by the plant were tabled in Parliament by the Opposition. Although at the time, EMC maintained that the problems encountered were normal during testing and commissioning, the Corporation requested BWSC to not only take remedial action, but to submit a detailed report on these faults.

On 7 November 2012, BWSC submitted a 'Preliminary Investigation Report' prepared by its steam turbine generator supplier, Dresser-Rand (D-R), on the damage to the steam turbine. The report indicated that after a machine failure on site, certain parts - the turbine rotor, nozzle chest, stop and emergency valve and diaphragms - were sent back to D-R (Peterborough), and arrived there on 24 October 2012. At D-R, a visual inspection of the rotor was carried out and blades were checked for damage, cracks and surface flaws. One of the blades was found to be broken. A number of blades were replaced and the rotor was re-bladed, cleaned, and re-balanced. The rotor was dispatched on 2 November 2012. The report also indicated that there was significant damage to the first stage nozzles, which were replaced and later assembled into the nozzle chest. The stop and emergency valve was fully surveyed and certain parts were replaced. A visual inspection and a dye penetration inspection of the diaphragms indicated that these were acceptable. These were dressed to return them back to an 'as new' condition. A conclusive report by BWSC in conjunction with D-R was, in the interim, also being prepared.

In the meantime, however, the Corporation did not allow BWSC to undertake the remaining performance testing of the plant before the root cause of the damages had been definitively established to EMC's satisfaction. Although BWSC objected, EMC insisted that the Corporation *"requires the root cause failure report of the steam strainer as well as the root cause report of the damage of the steam turbine. Both reports should be substantiated by appropriate inspection and analysis statements. Enemalta Corporation cannot consider taking over the plant before the reports listed above are received. It is also to be noted that the reports shall be submitted to an independent third party for review prior to taking over."*

BWSC took exception to EMC's unwillingness to permit the performance testing to go ahead without a copy of the supplier's report into the root cause of the damages to the steam turbine and/or a lengthy period of notice. Notwithstanding BWSC's contentions, EMC maintained its stance.

On 16 November 2012, BWSC forwarded a copy of the subcontractor's (D-R) 'Steam Turbine Repair Acceptance Report' dated 15 November 2012 that included a root cause analysis. The report summarised inspection procedures and recovery activities

carried out to date, a cause and effect analysis, as well as a list of corrective and preventive actions. It also indicated the re-build and re-commissioning which were carried out on site at Delimara. In the report, various root cause considerations were made and, based on these investigations, D-R determined that the root cause for the damages in the turbine was the initial collapse of the steam inlet strainer, which resulted in strainer particles entering the turbine causing damage to the nozzle ring and turbine blades. D-R replaced the strainer that initiated the event with another of a much more rigid design, eliminating the risk of strainer collapse. The steam turbine was also re-built and re-commissioned and D-R confirmed this to be fit for service and commercial operation. A conclusive statement verifying the operational readiness of the turbine was included in the D-R report.

EMC, however, did not consider the submitted report *“detailed enough to give the comfort that Enemalta Corporation is seeking regarding the root cause of the failure in connection with the incident of the steam turbine.”* According to EMC, no substantiating documents had been annexed to the report, including:

- blade fracture analysis report;
- reports of any investigations into the strainer failure;
- dimensional checks of the recovered strainer;
- analysis of weld quality;
- reports on weld failure mechanism;
- reports on material damage to the strainer and potential cause; and
- copies of the design calculation verification which were claimed to be have been carried out by BWSC’s subcontractor.

EMC further maintained that the report failed to address the key concern, that is, the cause of the strainer failure that led to the incident, save for analysis based on a theoretical cause, without taking into account the conclusions of any investigation carried out on the strainer. Also of concern to EMC was the fact that the corrective actions taken by BWSC appeared to be measures intended to address a possible fault in design. For these reasons, EMC considered the report unfit for the purpose it was intended and did not consider the repairs to the steam turbine to have been carried out to its satisfaction once the relative reports were not submitted in the required detail.

Consequently, EMC held its position that performance testing should not be carried out at this stage and insisted that tests *“shall be permitted once BWSC submits a satisfactory root cause analysis report of the failure of both the steam strainer as well as the turbine.”* EMC also indicated that the Corporation would be submitting BWSC’s report for analysis and endorsement by an independent third party consultant. EMC also insisted that such incidents should not recur; moreover, since the delay in taking over was resulting in substantial damages, the Corporation reserved all its rights and remedies.

Although BWSC concurred with EMC that the incident causing the damage should not recur, BWSC felt that appropriate steps had been taken to ensure this. BWSC, however, conceded that *“it is clear that the strainer has collapsed and entered into the turbine causing consequential damages. The root cause of the strainer collapse is not yet established. It may take time before a formal report is available by the external laboratory and there is a likely risk that a single and clear conclusion to the failure cannot be found. For the very same reason the original filter design has been replaced by a much more rigid strainer design, eliminating the risk of a future incident to happen. Though it will still be interesting to understand what happened to the old strainer ... this is no longer linked to the future operation.”*

With regard to the fractured blade, BWSC submitted that, *“Dresser-Rand is in the report concluding that the blade failure was the direct result of an impact to the trailing edge from the debris which subsequently led to crack propagation. This is based on their own examination of the broken blade and the rotor in general as well as results from the external laboratory examining the blade. Further to this Dresser-Rand has for sake of good order checked and verified blade bending stress calculations, centrifugal stresses, etc. and found all to be within design limitations and factors of safety. ... Finally and foremost, Dresser-Rand has made a thorough inspection of the rotor, and has after the necessary refurbishment, confirmed that the turbine after reassembly is fit for service and commercial operation.”*

BWSC further contended that, since formal reporting on such investigations is often rather time consuming to prepare, it is normal practice to base actions on findings from the examination as they progress, with the formal report to follow. BWSC held that they had been in close contact with D-R during the preparation of the root cause report, which they had also reviewed prior to its submittal. BWSC fully endorsed the report by D-R, adding that *“BWSC do find that appropriate and sufficient actions have been taken to prevent the incident to recur, and Dresser-Rand - the Original Equipment Manufacturer (OEM) of the turbine having prime responsibility for this supply, has in the report clearly confirmed that the steam turbine is fit for service and operation.”*

Furthermore, BWSC contested EMC's intention to submit the BWSC report for analysis and endorsement by an independent third party consultant stating that, *“the issue of the formal examination reports from a third party - not being a contractual obligation, is not a valid reason for not accepting the Tests on Completion to be finalized.”* BWSC insisted that these tests be allowed to be conducted without any further delay, a delay which it insisted was *“outside of our responsibility.”* Moreover, BWSC's commissioning staff and sub-supplier specialists were idle on site, pending EMC's approval for the remaining few days of testing activities. This situation was unacceptable to BWSC and it had no choice but to demobilize the site unless EMC gave the go ahead for the continuation of the Tests on Completion.

At this stage, an altercation between the parties regarding the partial taking over of the plant ensued, with BWSC insisting and EMC rejecting such taking over. This issue is discussed in more detail in Chapter 5 of the Report.

On 29 November 2012, BWSC forwarded EMC a 'Root Cause Analysis Investigation into the Failure of the 3rd Stage Rotor Blade and CSEV Monel Stream Strainer' report prepared by D-R dated 28 November 2012. The report and its contents were endorsed by BWSC.

The report gave a sequence of events between the 22 September and 5 October 2012. According to the report, on 22 September 2012, the turbine was intentionally stopped and, on this occasion, the emergency stop valve closed properly. However, at the end of the reliability test run, ending on 5 October 2012, it was noted that the CSEV (combined stop and emergency valve) did not close properly. Inspections carried out revealed that the concentric fine and coarse mesh strainer in the inlet of the CSEV casing had partly disintegrated. Fragments of the strainer had been conveyed with the stream into the stream path of the turbine. On opening the turbine, a blade was found broken as well as fragments of the coarse and fine mesh strainer. D-R field service personnel brought on site decided to return certain equipment (turbine rotor, nozzle chest, emergency stop valve and diaphragms) to their base at Peterborough, UK. Details of inspection and repair activities undertaken in the UK were reported. These had already been summarised in the 'Root Cause Analysis Investigation into the Failure of the 3rd Stage Rotor Blade and CSEV Monel Stream Strainer' report submitted earlier, but were described in more detail in this submission. Concluding this report, D-R maintained that *"following extensive inspections, review of operating data/reports and laboratory based investigations by D-R, BWSC and independent laboratories it can be concluded the root cause of the turbine failure has been identified as the steam strainer rotating within the CSEV casting and subsequently wearing the monel wire until its mechanical integrity has been compromised. This then allowed monel strainer debris to partially block the CSEV and prevent full closure of the valve. The monel strainer debris also caused damage and partial blockage to the guide vanes within the nozzle chest. Ultimately, this monel wire debris impacted one of the third stage blades causing an impact edge burr which led fatigue crack propagation and failure of the blade and shroud. The complete turbine has been re-examined and checked following the incident and it has been established that no other damage has occurred."* With regard to corrective and preventative actions taken, D-R stated that, *"in accordance with above conclusion an alternative design of CSEV strainer has been introduced and implemented. The preventive features of the alternative design are:*

- *stainless steel perforated plate material which eliminates the risk of single thread breaking off the strainer*
- *3 mm thick plate reducing the risk of strainer collapse*
- *installation of anti-rotation keys removes the possibility of the strainer rotating in the valve*
- *ensuring the position of the welded joint is not in the direction of inlet steam flow.*

The below actions have been completed in addition to the alternative steam strainer design:

- *additional steam blow cycle*
- *the results of the steam blow indicate that a fine mesh strainer is no longer required*
- *cyclone separator has been disassembled and cleaned in accordance with the manufacturer's instructions."*

With these measures, D-R and BWSC maintained that the damages to the plant had been addressed and all the necessary corrective and preventive actions had been taken.

Review of the Root Cause Report by DNV KEMA

EMC had appointed DNV KEMA as its independent technical consultant and submitted BWSC's root cause report for analysis and endorsement. The appointment of DNV KEMA is discussed in more detail in Chapter 8 of the Report.

On 5 December 2012, DNV KEMA submitted its 'Preliminary Report of Review' of the D-R/BWSC report. In general, DNV KEMA agreed with the analysis as reported although it held reservations on certain aspects of the actions taken by D-R. Specifically, DNV KEMA:

- agreed with the root cause analysis of the strainers as reported by D-R;
- agreed with the root cause analysis of the fractures in blade and blade shroud as investigated by an independent third party (The Test House, Abington UK);
- opined that the new design of the strainer is more robust than the original design and a collapse of the new strainer is eliminated, commented that a comparison with the original strainer assembly in terms of pressure drop is lacking, remarked that the result of the steam blow down is no reason to eliminate the fine mesh strainer;
- agreed in general with the inspections and activities performed on the rotor;
- commented that no inspection reports of the repairs of the control valve chest and nozzle box were provided by D-R;
- agreed with replacement of certain parts of the CSEV (combined stop and emergency valve).

DNV KEMA concluded that, *"in their report D-R specify the activities performed such as inspections, repairs, replacements, modifications, but are not conclusive based on*

the results of their inspections, repairs or replacements. Par example whether the subjected components are considered fit for service and whether their service life is or is not affected. Also the report provides no statement(s) about how guarantees are affected by the damage that occurred and related to the associated measures that were taken."

Further to its preliminary report, on 12 December 2012 DNV KEMA submitted a final review of the BWSC/D-R root cause analysis report. In this submission, DNV KEMA generally reiterated what was previously stated, concluding that, *"based on the results as reported, the root cause analysis of the failed strainer and the broken 3rd stage blade are affirmed. The inspection, measures, repairs and replacements performed by D-R are considered adequate. It is expected that with the implementation of the re-designed strainer, recurrence of strainer failure is eliminated. The statements of D-R after re-commissioning of the turbine, regarding the effects of the repairs, replacements and modification of service, operation and service life are satisfactory and acceptable."*

In addition to the review of the BWSC/D-R root cause report, DNV KEMA were engaged to witness post repair performance tests on site. In this regard, DNV KEMA were requested to submit:

- "(i) a declaration that the test methodology and procedure were in accordance with the contract and suitable for the purpose of correctly measuring the plant performance in terms of the contractual guarantees; and*
- (ii) a declaration that the performance test are confirmed to have been satisfactorily carried out and hence Enemalta may proceed with the taking over of the plant."*

On 14 December 2012, DNV KEMA submitted the requested declaration on the execution of performance testing, stating that, *"from December 11th till December 13th 2012, DNV KEMA has witnessed the performance test activities at the new Enemalta Delimara Power Plant extension. DNV KEMA - in its role as independent third party - hereby confirms that the performance tests have been satisfactorily carried out in accordance with the agreed Performance Test Procedure; hence in this regard Enemalta may proceed with the taking over of the plant."*

This gave way to EMC's taking over of the plant from BWSC on 14 December 2012.

NAO's Review of the BWSC/Dresser-Rand and DNV KEMA Reports

NAO requested its technical adviser to review and comment on the reports submitted by BWSC/D-R and KEMA on the failure of the steam strainer on 7 October 2012 and subsequent damage caused to the steam turbine, as well as corrective action taken. Of particular note was the fact that, in its report, KEMA had

recommended the installation of a fine mesh strainer. BWSC did not seem to be in agreement.

NAO's technical adviser submitted the following:

"1. Sequence of events

The sequence of events related to this incident are very well described in an undated and unsigned report [1]¹¹ and which is being quoted in full hereunder:

"The first incident involving the steam turbine occurred on the 7th October 2012 that is, after the end of the reliability run test, when during the shutting down operation of the steam turbine the stop valve failed to close fully. A manual stop valve had to be closed in order to interrupt the steam flow to the steam turbine and shut it down. An initial investigation by BWSC site personnel on 11th October 2012 indicated that the problem was not hydraulic in nature, and consequently a D-R Representative was brought on site to investigate the matter. The investigation conducted during the following days revealed that the steam line filters had burst and parts of these have lodged in the stop valve as well as within the steam turbine. Additionally the emergency stop valve and control valves were found to have impact evidence at some points. The steam turbine casing was opened up and the extent of the damage assessed. By the 13th October 2012 both Enemalta and BWSC were cognizant of the full extent of the damages sustained by the steam turbine unit. Preparations got under way to dismantle and ship the damaged parts to Dresser-Rand factory in the UK. All damaged items arrived at the Dresser-Rand factory in Peterborough on 24th October 2012. An initial report of the findings was submitted to Enemalta on the 8th November 2012.

The repaired rotor and parts arrived back on site on 5th November 2012. Following site erection works, the steam turbine was restarted for re-commissioning on 14 November when the ESV and all valves controlled by STG control unit were tested for correct operation. The steam turbine/gearbox/generator rotor assembly was site balanced to as new level of shaft vibrations. The governor was retuned to eliminate a low load hunting problem being experienced. The plant was ready for performance testing by the 21st November 2012.

A final report including a root cause analysis was submitted for Enemalta's review on 29th November 2012. The report was accepted by both Enemalta and its third party consultant. Following successful performance testing the plant was taken over on the 14th December. The steam turbine commenced commercial operation and was operating in a satisfactory way."

¹¹ This report was submitted by EMC on 14 January 2013 in reply to a query by NAO regarding damages sustained by the BWSC plant

In brief, what happened was that the mesh of the strainer broke and parts of it damaged the stop valve and the turbine. Dresser-Rand, who manufactured and supplied the turbine and also supplied the strainer presented three reports on the incident [2, 3 & 4], plus additional supporting information [6]. A fourth report was submitted by KEMA [7] who were engaged by Enemalta as external independent consultants to assist Enemalta in its evaluation of these reports and in particular the last report [4] which is the report that explained the root cause of the problem.

2. The first report

The first report submitted by Dresser-Rand [2] and dated 6th November 2012 details the inspection procedures carried out on the parts of the turbine that were received by Dresser-Rand in the UK, as well as the repair work carried out to return the turbine to a "as new" condition. The parts received were: turbine rotor, nozzle chest - valves, springs etc disassembled on-site, stop & emergency valve, all diaphragms.

A visual inspection of the rotor revealed the following:

- *a broken blade on the 3rd stage*
- *metal to metal contact on the 4th stage shroud*
- *debris inside the shroud of the shrouded stages.*

In order to remove the broken blade, 30 blades had to be removed. The broken blade was sent for a full investigation, results of which were to follow in a later report. The 29 removed blades had a Magnetic Particle Inspection (MPI) carried out to check for any damage. All 29 rotor blades passed the inspection. The remaining 3rd stage blades on the rotor were inspected, and as a precaution due to the metal to metal contact the 4th stage rotor blades were also inspected at the same time. Two inspection procedures were carried MPI and Dye Penetration Inspection (DPI) which all blades passed. Although the 3rd & 4th stage blades passed all inspections the decision was made to partially re-blade the 3rd stage, therefore 30 blades were replaced on this 3rd stage.

The 1st, 2nd, 3rd and 4th stage shrouds were machined to remove any rough edges and burrs, after which the rotor was re-balanced. The rotor had a coat of rust preventative applied and the bearing journal diameters protected. It was then packed in a bespoke wooden crate which was witnessed by a third party inspector and dispatched on the morning of 02 November 2012.

As for the nozzle chest, there was significant damage to the first stage nozzles and the decision was made to replace them. This process required the damaged nozzles to be machined out and new nozzles welded in position.

The stop & emergency valve had the following parts replaced with new parts: valve seat, pilot valve, splash shield, oil cylinder spindle & key, spindle guide/cover and bevel gears.

All the diaphragms were subjected to a dye penetration inspection. The only diaphragm that required any lengthy dressing was stage four to remove burr created by the metal to metal contact.

Certificates of the tests carried out were attached as appendices to the report.

3. The second report

The second report by Dresser-Rand [3] starts by summarising the inspection and repair activities that were reported in the first report [2]. It then reports the findings of the investigation carried out on the broken blade. It was concluded that the “blade fracture had resulted from fatigue cracking propagating from the trailing edge of the blade. The presence of a burr at the crack origin and impact type marks at the inner face of the blade suggests that the blade had suffered some impact type damage and that the fatigue crack grew from that damage.” None of the other blades showed any signs of damage. Dresser-Rand checked all the stress and vibration calculations on the blades and “found them all to be within design limitations and factors of safety.”

The report continues with a detailed Cause & Effect analysis using the Ishikawa¹² methodology, the result of which is a redesign of the strainer. The modifications have:

- *“eliminated the risk of strainer collapse*
- *removed the possibility of the strainer rotating in the valve (anti-rotation keys)*
- *improved the manufacturability of the strainer*
- *ensured the position of the welded joint is not in the direction of the steam flow.”*

The report also states that “The results of the steam blow indicate that a fine mesh filter is no longer required.” More about this later.

The report includes a description of the activities that were carried out at Delimara to bring back the turbine to operational condition and concludes that the turbine is now fit for service and commercial operation.

Although the redesign of the strainer suggests that the failure of the strainer had been identified as a possible cause of the damage to the turbine, the report fails to identify explicitly the root cause of the problem. Enemalta were therefore very correct in insisting on a report that identifies what exactly happened, and not allowing BWSC to restart the tests until this report was forthcoming.

¹² Ishikawa Cause and Effect (CE) diagrams are tools to investigate and identify numerous different causes of a problem. Common uses of the Ishikawa diagram are product design and quality defect prevention and are used to identify potential factors causing an overall effect.

4. The third report

The third report [4] is entitled "Root Cause Analysis Investigation into the Failure of the 3rd Stage Rotor Blade and CSEV Monel Steam Strainer" and is dated 28th November 2012.

The report gives a time-line of the events related to this incident and then repeats the summary of the inspections and repair work carried out as well as the site activities to get the turbine operational again. Copies of the "first" and "second" report are included as appendices.

It gives a summary of the laboratory tests carried out on the broken 3rd stage blade and confirms that it broke due to fatigue initiated by impact damage. A full copy of the laboratory test report is given in an appendix.

The laboratory investigation of the steam strainer failure is summarised next. Again, a full report is included as an appendix. Basically the conclusion is that the debris found in the valve and turbine is of the same material as the steam strainer. The report concludes that "the outer coarse mesh exhibits extensive evidence of contact wear, consistent with the strainer having been turned hard against the casing. The wire welding quality has been inspected and no evidence of defective welding has been found."

The root cause of the failure of the strainer is thus identified. Due to the importance of this failure to the whole issue, I am quoting verbatim from the report:

"The root cause of the strainer failure has been identified as the strainer rotating within the CSEV casing, leading to excessive wear, and subsequent collapse.

The principle of retaining the monel steam strainer relies upon a clamping force across the strainer. It is clear that in order for the strainer to rotate that at some point this clamping force has been compromised.

Considering the failure mode, the following possible contributory factors to strainer rotation have been identified:

- loss of clamping force
- assembly error
- manufacturing error.

Un-equal pressure distribution profile across the strainer caused by:

- weld seam
- fine mesh filter
- scale deposits
- variations in steam velocity profiles.

Having identified possible causes of rotation it has not been possible to fully determine a true sequence of events that ultimately led to the lack of compression and therefore strainer rotation.

It is likely that a combination of the above allowed the strainer to rotate.

It has not been possible to confirm the original strainer measurements due to the level of damage.

Corrective and preventive actions have been identified and implemented for the alternative strainer design, details of which can be found within section 10 of this report.”

Perhaps, it is worth pointing out that the rotation of the cylindrical mesh strainer within the valve casing caused the outer surfaces of the wires making up the mesh to rub against the walls of the casing thus wearing out until bits of the wire broke off. Photographs in the report show this very clearly.

The corrective actions listed in section 10 of the report are the following:

- *Stainless steel perforated plate material (instead of a wire mesh) which eliminates the risk of single threads breaking off*
- *3mm thick plate reducing the risk of strainer collapse*
- *Installation of anti-rotation keys removes the possibility of the strainer rotating in the valve*
- *Ensuring the position of the welded joint is not in the direction of inlet steam flow.*

Again, the report concludes that “the result of the steam blow cycle indicate that a fine mesh strainer is no longer required.”

It is pertinent to point out that the strainer consists of two concentric cylindrical filters, one fine and one coarse which nest one inside the other and are kept in place by the clamping force exerted by the top cover of the strainer.

This report satisfactorily explains what went wrong. It would appear that a “Failure mode and effect analysis (FMEA)” was not carried out on the design of this strainer. It is possible that this was the first time that a strainer of this design failed in this way. As long as the clamping force on the strainer itself kept it from rotating, then the strainer would operate as designed. However, the actions taken to stop this problem recurring are satisfactory.

Enemalta were right in accepting this report and giving BWSC the go-ahead to resume the testing of the plant.

5. Supporting Information

By letter dated 5th December 2012, Enemalta requested BWSC to provide the following information:

1. Comparison between the original steam strainer assembly and the new steam strainer in terms of pressure drop.
2. Since the new steam strainer is manufactured from a stainless steel 3mm plate with perforations of 10mm, comments regarding the re-installation of the fine filter in the steam system as a protection for the steam turbine against small particles / foreign objects e.g. oxide particles, welding debris etc that can be released from the boilers.
3. Inspection Report and QA/QC information regarding the repair of the Control Valve Chest and Nozzle Box. BWSC are to note that such information has already been provided for the blade and diaphragm repairs.
4. Conclusive report based on the results obtained from the inspections, repairs and replacements performed by Dresser-Rand. Such a conclusive report should include the effect of the repairs on the service life and suitability of the components and of the steam turbine to be fit for service and the release for commercial duty.
5. Statements regarding the effect of the damage and related measures that were carried out on the guarantees."

BWSC responded by submitting a calculation which showed that the pressure drop of the new strainer was in fact less than the original design, partly because of the elimination of the fine filter. [5]

The other queries were dealt with in a separate document [6]. This document is undated but the covering letter from BWSC is dated 11th December 2007 (sic!). This report covers the following points:

1. Re-installation of fine mesh strainer. Dresser-Rand makes reference to Section C6 VI Completion of Commissioning of the Installation, Operating & Maintenance Manual. As stated in this manual and on the steam strainer drawing itself, "after commissioning, the fine mesh strainer must be removed leaving only the coarse mesh strainer." Hence, now that commissioning was complete and that steam blowing was satisfactorily carried out, then Dresser-Rand were recommending that the fine mesh strainer is not re-installed.
2. Nozzle chest repair and inspection. Dresser-Rand provide further details regarding the repair and inspection of the nozzle chest.

3. *Conclusive statement. Here Dresser-Rand after explaining very briefly what happened and making reference to the reports submitted, confirm that “the inspection, repair and re-commissioning activities carried out on the turbine have rendered it fit for service and commercial operation. These procedures have in no way affected the service life of the turbine. All repair activities have satisfactorily returned the turbine to serviceable condition. D-R confirms that this will not affect the steam turbine performance, service life or warranties in accordance with the contract.”*

6. KEMA report

KEMA was commissioned by Enemalta to review the Root Cause Report submitted by Dresser-Rand. It submitted its report on the 12th December 2012 [7]. KEMA agrees with the root cause analysis of the strainer failure as reported by Dresser-Rand and with the root cause analysis of the fractures in blade and blade shroud as reported by TTH (The Test House), a laboratory to whom Dresser-Rand sent the broken blade for analysis.

According to KEMA the original design of the strainer was inadequate and not robust. They consider that the “new design of the strainer is more robust than the original design and expected is that rotation and collapse of the new strainer is eliminated.”

Furthermore, the calculations submitted by Dresser-Rand show that the new design has a lower pressure drop.

It is not quite clear whether KEMA are in fact recommending the re-installation of the fine strainer. On the one hand, they state that they “would recommend to consider re-installment of the fine strainer”. On the other hand they accept Dresser-Rand’s statement “that the fine strainer is no longer required, if satisfactory steam blowing has been carried in accordance with D-R quality procedures. The acceptance certificate of the steam blowing test accompanied this additional information.” See also comment by Dresser-Rand on previous page. It is pertinent to point out that if the decision is taken to re-install the fine mesh strainer, then one would have to seriously consider whether the fine mesh strainer also needs to be redesigned.

KEMA agrees in general with the inspections and activities performed on the rotor. They are however critical of the fact that Dresser-Rand does not provide visual inspection certificates although they do carry out visual inspections. KEMA is also critical of the fact that the turbine rotor was only balanced at low revs (300rpm). This is, however, not a problem as the commissioning tests show that the measured vibration levels of the turbine are lower than what is required by the relevant ISO standard [8].

KEMA is also critical of the fact that the diaphragms were only inspected using Dye Penetration Inspection.

Based on what was reported by Dresser-Rand, KEMA agrees with the replacement of parts for the Stop and Emergency Valve.

KEMA is critical of the fact that the report provides no statement(s) about how guarantees are affected by the damage that occurred and related to the associated measures that were taken. However, this was taken care of in the Conclusive Statement of the document submitted by Dresser-Rand entitled Supporting Information for Dresser-Rand Document PE-TR-12-005 [6]. KEMA find this conclusive statement satisfactory.

KEMA conclude their report as follows:

- “Based on the results as reported, the root cause analyses of the failed strainer and the broken 3rd stage blade are affirmed.*
- The inspections, measures, repairs and replacements performed by D-R are considered adequate.*
- It is expected that with the implementation of the re-designed strainer, recurrence of strainer failure is eliminated.*
- The statements of D-R after re-commissioning of the turbine, regarding the effects of the repairs, replacements and modification on service, operation and service life are satisfactory and acceptable.”*

7. Conclusions

The following conclusions can be drawn from the above.

- 1. The original design of the steam strainer was not adequate. Failure of the mesh strainers caused serious damage to the steam turbine, and the Stop and Emergency Valve (CSEV).*
- 2. The new design of the strainer is considered robust enough and should not cause any further problems.*
- 3. It seems that KEMA accepted Dresser-Rand’s arguments against the re-installation of the fine mesh strainer. However, should the decision be taken to re-install it, the design of this strainer should be checked against possible failure.*
- 4. The inspection and repair procedures have been carried out professionally.*
- 5. A number of 3rd stage blades were replaced with new ones. All guide vanes on the nozzle box were replaced. A number of parts on the CSEV were replaced. As such, the turbine and CSEV can be considered to have been returned to “as new” condition.*

6. *Dresser-Rand have confirmed that the repairs carried out will not affect the steam turbine performance, service life or warranties in accordance with the contract.*
7. *Enemalta were very right to insist on a detailed root cause report. Only by having a report that gave a satisfactory explanation of what caused the failure of the strainer, could Enemalta judge whether the remedial action taken (a re-design of the strainer) was acceptable.*
8. *KEMA confirmed that they were satisfied with the work carried out by Dresser-Rand to remedy the situation.*¹³

In view of the fact that technical issues related to the damage to the strainer and steam turbine of the BWSC plant were exhaustively dealt with by NAO's expert adviser as reproduced above, no further comments are being made in this regard.

¹³ A list of references was included in the report by NAO technical expert, namely:

1. Report entitled "Dresser Rand Steam Turbine - Timeline of events following the end of the reliability run period", undated and unsigned, sent to me by NAO on 16th January 2013.
2. Dresser-Rand Steam Turbine Repair Preliminary Inspection Report, Technical Report Number: PE-TR-12-002, Author: Chris Greenham BEng Hons, Design Engineer - Steam Turbines, 6th November 2012.
3. Dresser-Rand, Steam Turbine Repair Acceptance Report, Technical Report Number: PE-TR-12-004, Author: Chris Greenham BEng Hons, Design Engineer - Steam Turbines, Approval: James Richmond BSc (Hons), CENG, MIMechE, Engineering Manager, Uk, 15th November 2012.
4. Dresser-Rand, Root Cause Analysis Investigation into the Failure of the 3rd Stage Rotor Blade and CSEV Monel Steam Strainer, Technical Report Number: PE-TR-12-005, Chris Greenham BEng Hons, Design Engineer - Steam Turbines, Approval: James Richmond BSc(Hons), CENG, MIMechE, Engineering Manager, Uk, 28th November 2012.
5. Record of Calculation Coarse Mesh Steam Strainer Pressure Drop for Contract TC56130 Drawing Number T45/3/02105 - Item A.
6. Dresser-Rand, Supporting Information for Dresser-Rand Document PE-TR-12-005
7. DNV KEMA Energy & Sustainability, Enemalta Delimara PS, Malta Review of Dresser-Rand RCA report PE-TR-12-005 of steam turbine TC56130 (Ref. GN/DPS/DO/2225/2012), B.M. Kaufman, 12 December 2012.
8. Dresser-Rand, Frame 20 Steam Turbine Baseline Report, 12th to 15th November 2012, author: Mark Phoenix, CBM Engineer.

Chapter 5:

PARTIAL TAKING OVER

Speculation of a possible partial taking-over by EMC started to appear in the local media sometime in mid-October 2012. Serious doubts were raised as to whether this was the right decision, more so in view of the considerable faults that were regularly being reported. In late October 2012, the Corporation clarified its position in this regard, underlining its reluctance to take over part of the works since this could lead to additional operational, technical or legal risks that, at the time, seemed an unavoidable consequence of partial taking over. At this point, EMC maintained its position that the whole of the works were to be taken over following the successful completion of performance testing of the whole plant.

On 7 November 2012, BWSC submitted a preliminary investigation report on the turbine damage sustained at the new plant at Delimara. A conclusive report by BWSC in conjunction with its steam turbine generator (STG) supplier, Dresser-Rand, was also being prepared. In the interim, however, EMC did not allow BWSC to carry out the remaining performance testing of the plant before the root cause of the STG failure had been established. On its part, BWSC objected to this stating that it considered this *“as a further strengthening of the conditions that Enemalta unilaterally is imposing on us in our present difficult situation. We find this unacceptable to BWSC. The re-commissioning work and testing activities of the STG unit is being fully supervised by the manufacturer Dresser-Rand and we must insist in having your full support for the performance testing of the plant to continue as planned.”* Moreover, BWSC complained that in addition to this complication *“we seem to be experiencing problems with provisions of the necessary electrical load from Enemalta to perform our plant testing in an efficient manner. ... Obviously provision of the load that we ask for is a definite requirement for us to complete plant testing without further delay.”*

On the other hand, EMC maintained that the Corporation *“requires the root cause failure report of the steam strainer as well as the root cause report of the damage of the steam turbine. ... Enemalta Corporation considers that there was ample time to compile and present the required reports to Enemalta Corporation for its review and approval.”* Moreover, EMC insisted that it *“will require adequate time to allow its independent Consultant to review the reports prior to providing its comments thereon to BWSC and formulating any instructions to BWSC on the basis of the information available in the report. Without having sight of the reports setting out the cause of the incident resulting in damages to the steam turbine, EMC cannot allow BWSC to continue with the performance testing of the plant, since the necessary precautions to avoid a repeat incident cannot be taken, or even identified. In terms of clause CC.4.21 of the general conditions of contract, the damage caused to the steam turbine is to be made good by BWSC, to the reasonable satisfaction of the Purchaser’s Representative. The Purchaser’s Representative cannot be satisfied*

with the repairs and reconstruction of the steam turbine alone, without having access to the required reports relating to the cause of the incident. Insofar as the load is concerned, Enemalta Corporation refers to Clause CC 4.26(i) of the general conditions of contract. In terms of this provision, BWSC is to give advance notice of the date on which it shall be ready to carry out the Tests on Completion (of which the performance testing forms part). This prior notice is required for Enemalta Corporation to ensure that the necessary facilities, including the required load and other conditions, are available for the testing to be carried out. ... Enemalta reiterates that it cannot accept to allow performance testing to commence without having the possibility of identifying and implementing any safeguards against a repeat incident which could cause damage to the plant after it has been taken over. Accordingly, performance testing is not to commence until adequate notice of the dates on which testing is to be carried out is given, and the abovementioned reports are approved, following which, and after having identified any precautionary measures required to be taken, performance testing can commence.”

BWSC took exception to EMC’s unwillingness to permit the performance testing to go ahead prior to the availability of the supplier’s report into the root cause of the damages to the steam turbine and/or a lengthy period of notice. BWSC insisted that *“there is no provision in the contract entitling you [EMC] to refuse to permit the Test on Completion to be completed prior to the receipt of such a report. We must also put on record our position that there is no provision in the Contract for you to insist that we give any particular period of notice prior to re-commencement and completion of the Tests on Completion, and to this effect, we must remind you that our letter ... dated 4 June 2012 gave the requisite contractual notification that the Tests on Completion would be commencing on 19 June 2012. We will therefore not accept any liability for delay in Taking Over caused by your refusal to allow the testing to be recommenced on 16 November 2012 and all rights are reserved.”* BWSC maintained that the plant was a combined cycle plant with eight diesel engines and a steam turbine. The plant was designed for single cycle operation of the diesel engines only, that is, the diesel section of the plant, which could be perfectly and safely operated at its full capacity on a commercial basis without the steam turbine unit. As to the legal aspect of partial taking over, BWSC was open to discuss any concerns EMC had in this regard.

Notwithstanding BWSC’s contentions, EMC upheld its position with regard to partial taking over. Performance testing of the diesel section of the plant had been on hold since 24 October 2012. Although BWSC complained that its site commissioning personnel were idle pending EMC’s go ahead to proceed with the official performance testing of the diesel cycle plant of the plant, EMC maintained that the incident resulting in damage to the steam turbine generator made it impossible for the works to be taken over as planned. Moreover, according to EMC, the contract provided for partial taking over only if the works were divided into sections. While the diesel cycle of the plant could be operated separately, this did not imply that the diesel cycle constituted a section of the works for taking over purposes. Indeed, the contract did not define it as such, and no provision was made for commissioning of

the diesel cycle on its own. Furthermore, the performance guarantees were linked to the testing of the entire works, with no indications of performance guarantees relating to individual sections should partial taking over be taken up.

Notwithstanding EMC's argumentations, BWSC contended that it was possible for EMC to have a partial taking over of the plant (whole plant less steam turbine) and that:

- partial taking over could have been undertaken without the steam turbine - all reliability tests had been completed, the problem only affected the steam turbine and power could have been generated safely solely relying on the diesel units;
- contrary to EMC's assertions, the contract did provide for the taking over of part of the plant - for example the contract provided that liquidated damages should be levied at *"such fraction of contract price as liquidated damages would properly be attributed to the said failure of works that cannot be put to use intended"*;
- the completion provisions in the Contract envisaged partial taking over of the Works - there was further an implicit duty on both parties to agree to revised performance test criteria to facilitate a partial taking over - something EMC had failed to cooperate with BWSC in complying with;
- pursuant to the general principles of law, EMC was obliged to partially take over the works and had a duty to mitigate its losses, such as by agreeing to revised performance tests criteria (which implicitly by the terms of the contract were to be revised in the event of partial taking over). Therefore, the longer EMC delayed in failing to mitigate its losses, the greater would be the reduction in entitlement (if any) to liquidated damages for delay to the partial takeover of the Works.

Irrespective of BWSC's claims, EMC maintained that *"There are no provisions for any performance guarantees of the individual components of the plant, should partial taking over be considered. In this respect, and as BWSC are well aware, Enemalta Corporation was conducive to discussions in good faith, on a without prejudice basis, to seek satisfactory corrections to the performance guarantees to apply in the circumstances. However, in no way is there a 'duty' to agree on revised performance test criteria. The fact that the corrections proposed by BWSC do not address Enemalta Corporation's technical and other concerns does not render Enemalta Corporation uncooperative"*.

BWSC did not concur with EMC and maintained its stance on the partial taking over of the plant by the Corporation. BWSC contended that it found it unfortunate that EMC refused a partial taking-over of the diesel cycle part of the plant, which according to BWSC, could be perfectly tested and commercially operated at more than 90 per cent of the total plant capacity with considerable environmental and fuel

efficiency benefits for EMC. BWSC stressed that the contract covered such situations and regretted the fact that EMC was not prepared to accept the execution of the outstanding performance testing. Furthermore, the stance taken by EMC was delaying the progress of the project, resulting in severe time and cost implications for both parties. BWSC insisted that, while EMC was contractually entitled to instruct BWSC to stop works by not allowing partial taking-over and not allowing performance testing to be executed, BWSC could not accept that EMC puts up restrictions beyond those envisaged in the contract - such as requesting the root cause analysis reports and own third party evaluation of the turbine incident prior to allowing any further testing of the plant.

While EMC acknowledged the potential efficiency and environmental advantages, the Corporation remained of the opinion that BWSC failed to appreciate the additional risks to EMC, which it was under no obligation to assume. EMC insisted that it was not under any obligation to take over part of the plant, excluding the steam turbine. Although the contract did make provisions for partial taking over, those provisions were only applicable in the limited circumstances set out in the contract. According to EMC, such circumstances did not include the situation in question.

Despite discussions held between the parties in a bid to seek ways in which to adapt the performance test criteria set out in the contract to that part of the plant that had been completed, concerns remained which EMC felt had not been addressed through the proposals made. In the circumstances, EMC felt that partial taking over was premature. Although acknowledging BWSC's willingness to assist EMC, the Corporation reiterated that, while it was keen on the plant being such that it could be taken over, EMC still required the reports and substantiation requested in order to be convinced that the plant was indeed fit for purpose, and that all precautions have been taken to avoid an incident similar to the one experienced. Until then, EMC was unwilling to consider partial taking over¹⁴.

The issue of partial taking over was eventually superseded by events when EMC took over the entire plant from BWSC on 14 December 2012. However, this Office reviewed and obtained legal advice on the implications to both the Corporation and the Contractor in the event, or in this case lack of, of partial taking over. This was deemed of importance in view of the divergence of opinion between EMC and BWSC with regard to partial taking over as established in the Conditions of Contract, and potential claims that could be made by the parties.

Specifically, this divergence concerns the taking over process as contractually defined. As per Contract:

¹⁴ EMC took over the plant on 14 December 2012 after the submission of a final report by BWSC/D-R, subsequently endorsed by EMC advisers DNV KEMA.

“taking over” is defined as “the Purchaser’s taking over the works in accordance with clause CC.4.27”;

“taking over certificate” is defined as “having the meaning stated in clause CC.4.27”;

“tests on completion” are defined as being “such tests to be made by the Contractor as are provided for in the Contract and other such tests as may be agreed between the Purchaser and the Contractor”; and

“works” are identified as to “include all Plant to be provided and work to be done by the Contractor”.

As per the above mentioned contract, CC.4.27 - Taking over - states:

“As soon as the Works have been completed in accordance with the Contract (except minor outstanding works or defects which will not substantially affect the use of the Works for its intended purpose and except for the maintenance thereof ...) and have passed the Tests on Completion, the Purchaser’s Representative shall issue a certificate (herein called a “Taking Over Certificate) in which he shall certify the date on which the Works have been so completed and have passed the said tests and the Purchaser shall be deemed to have taken over the Works on the date so certified ...”.

In connection with this issue, clause CC.4.21 - Liability for Accidents and Damage - is also relevant:

“The Contractor shall take all risk of accident or damage to the Works from whatever cause arising or occasioned by any act or omission of the Contractor or any Sub-Contractor employed by him, other than uninsurable risks, until the Works are taken over. All losses of and damages to any portion of the Works that shall not have been taken over resulting from the foregoing shall be made good by and at the sole cost of the Contractor and to the reasonable satisfaction of the Purchaser’s Representative”.

EMC acknowledged that the damage incurred after the first regime of testing, namely the damage to the strainer and the steam turbine, was made good and that physically the plant was again ‘complete’. EMC, however, insisted that this would only be proven once the tests, post repairs carried out, were repeated.

EMC remained concerned about the faults, insisting that the Corporation required assurances that BWSC had taken all adequate measures to avoid repeats of such incidents. EMC requested detailed reports of the incidents and the causes leading to them. Without such conclusive reports, EMC felt that it could not gain the assurance that the measures taken by BWSC were sufficient and so could not consider the repairs as having been completed to its reasonable satisfaction as set out in clause CC.4.21.

Admittedly, BWSC did submit an initial report outlining the damages to the plant. However, according to EMC, the report was not professionally drawn up and lacked substantiation in that it referred to mathematical calculations that were not included as evidence in the report. As such, the report was deemed unacceptable in that it neither answered EMC's queries nor put the Corporation's mind at rest. Consequently, EMC did not allow BWSC to proceed with the remaining tests.

On its part, BWSC insisted that the plant had undergone all necessary repairs and that testing could continue without further delays. It is to be noted that, as per Clause CC.4.27 (Taking over), successful completion of these tests would kick start the taking over process automatically, with the Purchaser's option to break off or otherwise interrupt the process.

Having reached an impasse where both parties were unwilling to budge from the respective positions taken, EMC started to charge BWSC 'liquidated damages' amounting to €1.6 million per week for late delivery in not meeting the (revised) scheduled completion date of 7 November 2012. On its part, BWSC threatened to impose 'delay fines', presumably on the force of clause CC.4.28 - Suspension of Works - which states:

"All reasonable expenses incurred by the Contractor by reason of the suspension of the Works by the Purchaser's Representative (otherwise than in consequence of some default on the part of the Contractor) or by reason of the Contractor being prevented from or delayed in proceeding with the Works by the Purchaser's Representative, ... shall be added to the Contract Price ..."

This Office sought legal advice on the issue of partial taking over, in particular the position regarding the taking over concept and mechanism in the Contract covering the construction and eventual handing over of the extension of the power station at Delimara. NAO questioned whether:

- a. EMC could reasonably refuse BWSC from resuming testing - ultimately leading to the automatic taking over - once BWSC had repeatedly maintained that the damages had been repaired with no consequential losses to the Corporation; and
- b. EMC's concerns regarding the possible negative outcomes and the additional operational, technical or legal risks that could materialise as a consequence of partial taking over were justified.

According to legal advice obtained *"The whole matter is covered by the contract. Taking over is as defined in clause 4.27 of the contract. This specifies that taking over takes place 'as soon as the works have been completed in accordance with the contract ... and have passed the tests on Completion, the Purchaser's Representative shall issue a certificate (herein called a 'Taking over Certificate')"* The issue of this certificate is therefore mandatory on the purchaser if the necessary events have taken place which makes it incumbent on the purchaser to issue the certificate. The

issue of the certificate establishes the taking over beyond any doubt. But it is only mandatory to issue such certificate if there is what I would think of as substantial completion of the whole plant, and provided the necessary testing has successfully taken place. The whole matter therefore pivots on the testing; the issues are technical in nature. But as a matter of law the taking over cannot take place before the testing can take place and before this is successfully carried out.”

In essence, the issue of partial taking over should have become irrelevant once EMC took over the plant on 14 December 2012. It is to date however still unclear whether this issue will continue to be pursued by the parties since EMC has raised claims for liabilities due for delays attributable to BWSC, whilst the latter still maintains its stance that partial taking over was a viable option. The question of claims is discussed in more detail in Chapter 6 of the Report dealing with claims and counter-claims for delay and liability charges.

Chapter 6:

CLAIMS AND COUNTER-CLAIMS FOR DELAY AND LIABILITY CHARGES

According to the contract signed between EMC and BWSC for the supply of generating capacity at Delimara, the completion date of works was 26 months from commencement date, that is, 20 July 2009, effectively implying that the works were to be finalised by end September 2011. The completion date was, however, subsequently extended to 7 September 2012 and then 7 November 2012. According to EMC, there were three major causes of delay that resulted in time extensions being granted to BWSC. One was the late issue of the construction permit by MEPA, the second was the late issue of the IPPC permit again by MEPA, and the third was related to the specification of heavy fuel oil (HFO).

According to EMC, the construction permit by MEPA was issued some eight months after the contract with BWSC was signed. As a result, although design work and all components that had to be manufactured off site could proceed, actual work on site could not be started until the construction permit was in hand. This had a direct effect in terms of delay to the project *per se* and other consequences in that the parts of the plant manufactured, despite being delivered to site, could not be installed. The second delay was related to the IPPC permit. EMC claimed that it was informed by MEPA at a very late stage that 'hot testing' of the plant - whereby the whole plant is tested under load and is actually generating electricity - could not proceed without this permit. The third delay was in relation to the quality of the heavy fuel oil itself. Once EMC obtained the IPPC permit, which now allowed EMC to actually start the 'hot testing', it was found that the fuel available was not of the right quality. As a result, EMC ordered a specific consignment of fuel that was delivered about a month later. This was now around mid-January 2012. Unfortunately, when this fuel was bunkered, it was contaminated by fuel that was still in the tank, causing further delays. In view of these delays, BWSC was granted subsequent extensions leading up to 7 November 2012.

When the Corporation issued time extensions to BWSC, the latter were relieved of any liquidated damages for delays that would have otherwise been due to the Corporation. Moreover, EMC acknowledged the fact that BWSC could possibly incur extra costs due to these delays/extensions and was willing to settle any claims made by BWSC, provided these were fully substantiated.

On 21 November 2012, BWSC raised three invoices for additional expenses incurred resulting from delays attributable to EMC. These invoices were for €8,043,948 for the delayed availability of the construction permit, €3,310,270 for the delayed availability of the IPPC permit and €1,914,316 for the delayed supply of the correct specification of HFO.

On its part, EMC made counter-claims for liquidated damages for delays. Between end November and mid-December 2012, EMC raised five invoices for delays for the period 7 November to 11 December 2012 totalling €8,247,500. EMC also claimed costs for the supply of urea and sodium bicarbonate to BWSC, used in testing and commissioning activities. Although BWSC was to replace amounts used, by keeping sufficient stocks of these items on site, the Corporation had incurred demurrage charges on the delivery containers. These charges amounted to €62,000 excluding VAT. In addition, EMC intended to recoup nearly €4 million resulting from negative variations that would be deducted from payments due to BWSC. These were in respect of the omission of a 3.3kV switchgear, reduction in stack height, the omission of SCR bypass ducts and reduced scope abatement systems.

Notwithstanding the above, both BWSC and EMC are contending charges levied against them. BWSC is contesting the liquidated damages for delays on the principle that EMC could have mitigated the costs by engaging in a partial takeover process of the plant. EMC maintains that partial takeover was not a viable option as the Corporation had to safeguard its position. Chapter 5 of this Report covers this issue in detail, and highlights the main reasons leading to ECM's refusal to partial takeover. On the other hand, while not contending the principle of the invoiced charges, EMC is contesting the amounts claimed for delays. To this extent, EMC informed BWSC that the Corporation is contesting the invoices received insofar as the amounts claimed exceed those accepted by EMC. The Corporation also informed BWSC that the uncontested amounts shall be duly paid by the due date as per Contract.

It appears that, despite negotiations between the parties, no agreement was reached and the matter will have to be resolved through arbitration. As stated in NAO's April 2010 report, the venue for arbitration was changed from Malta, as indicated in the tender document, to the UK in the contract as signed with BWSC.

Chapter 7:

STATUS OF THE MAINTENANCE AGREEMENT

An outline proposal for a spare parts and maintenance agreement was included in the contract signed with BWSC for the Delimara extension. The proposal - 'Spare Parts and Technical Service Agreement' (SPTSA) - was for a five-year duration with a cost capped at €18 million over the five years, subject to escalation according to agreed indices. It was the intention of both parties at the final set of negotiating meetings to conclude the maintenance agreement before the signing of the main contract. However, in part due to the fact that the design of the plant had not at the time been determined with absolute precision, the maintenance agreement remained at a 'conceptual outline proposal' stage, subject to further negotiations.

Following contract award, EMC had been actively negotiating with BWSC to conclude the maintenance agreement. However, according to the Corporation, during discussions, the proposed SPTSA was significantly altered from the original approved framework concept, mainly due to changes in BWSC's position. EMC became increasingly concerned with BWSC's apparent intent to change the scope and terms originally agreed to since in effect this would mean that the Corporation would either incur higher costs or face a reduction in benefits through reduced scope of services and/or reduced duration. By February 2013, no agreement between EMC and BWSC had been reached.

At this stage, EMC decided to investigate other options. According to the Corporation, while BWSC was in a position to maintain the entire plant, the component where EMC lacked in-house expertise and required outsourced maintenance was the diesel engines. The rest of the plant was quite standard and EMC felt confident it could operate and maintain it itself. In view of this, EMC considered entering into a short-term interim service agreement pending the re-issue of a new tender for a suitable long-term maintenance agreement. The Corporation directly contacted Wartsila (the original equipment manufacturer of the engines) and BWSC, requesting quotations for an interim one-year maintenance agreement, extendible to up to two years. Each company was requested to quote for two options, namely:

1. maintenance for the engines and directly associated plant; and
2. maintenance for the whole plant.

Wartsila provided a quote for the first option only, while BWSC only quoted for the maintenance of the whole plant. Both proposals were analysed and EMC opted for the less expensive Wartsila proposal. Following discussions with Director General Contracts (DoC), it was initially agreed that the Corporation would formally request approval from DoC for a short-term interim agreement (under the provisions of the

negotiated procedure), while in parallel, submit for review and approval, a first draft of a tender for a long-term maintenance agreement covering the plant.

As at the beginning of April 2013, a one-year maintenance agreement, extendible by up to one year in three-month periods, was in the final stages of conclusion. At the time, the finalised text had been agreed to between the parties but the agreement was still pending signatures. According to EMC, due to the policy to convert the plant to gas firing by March 2015, the work on the five-year maintenance agreement tender, initially scheduled to start in 2014 up to 2019, was temporarily suspended. As stated by the Corporation, the most practical solution was to extend the one-year maintenance agreement to a two-year period - which the one-year contract allows - and a maintenance tender is issued for the converted plant. The converted engines operating on gas have a different maintenance regime than the present ones operating on liquid fuels; thus the scope of works is different. According to EMC, a decision on this issue from "higher authorities" is still pending.

Chapter 8:

APPOINTMENT OF EMC TECHNICAL CONSULTANTS DNV KEMA

The 'cold'¹⁵ commissioning of the BWSC Delimara extension initiated in May 2011, with the first engine starts following in December 2011 and performance testing commencing in September 2012.

According to EMC, in October 2012, following the completion of the commissioning and reliability tests, a fault was identified on the steam turbine stop-valve. Investigations revealed that this fault was caused by parts of the strainer, installed just in front of the steam turbine, which had dislodged. Some of these parts had passed into the steam turbine causing foreign object damage. This was being investigated by the manufacturer.

At the time, EMC had not yet taken over the plant and the Corporation held BWSC responsible for the damages and repairs. In addition to repair liability, EMC requested that BWSC draw up a 'root cause' report, identifying the cause and extent of the damage. This analysis entailed metallurgical and detailed fracture analysis, in order to determine why the filter and turbine blade broke. Due to the nature of analysis required and EMC's lack of expertise in these fields, the Corporation opted to engage an independent external consultant. At this stage, the role of the consultant was limited to the review of and comment on the 'root cause' analysis that was to be submitted by BWSC. EMC felt it would then be in a better position to ascertain whether the analysis by BWSC was comprehensive enough and whether the results of the analysis were substantiated.

In view of considerable pressure faced by EMC, the possibility of delay charges being imposed by BWSC, and the regulatory repercussions from the continued operation of the Marsa Power Station, the Corporation felt that it was not in a position to follow the open or negotiated procurement procedures for the engagement of external consultants, since these procedures would entail a minimum of forty days. EMC therefore invoked Article 60(d) of the Public Procurement (2010) legislation and opted to engage the consultants through a direct order. The approval of the Ministry of Finance, the Economy and Investment for the placing of a direct order was sought.

Initially EMC contacted eight companies requesting a quote for this consultancy service. At this stage, the Corporation requested the Malta Financial Services Authority (MFSA) to conduct checks to establish the standing of these organisations and any possible connections between these firms and BWSC or Dresser-Rand. Not being in a position to undertake this task, MFSA forwarded to EMC the contact details of a firm that conducts due diligence enquiries for the Authority.

¹⁵ During cold commissioning, the various items of plant are tested individually, not as a whole. This is the first series of tests undertaken.

Following the submission of offers from four of the eight firms initially contacted, EMC shortlisted the prospective consultants list to two - DNV KEMA Energy & Sustainability (DNV KEMA) and ABS Consulting, subsequently engaging DNV KEMA on 21 November 2012. Although initially entrusted with the critical review of the steam turbine failure report, EMC deemed it necessary to further extend the assignment to DNV KEMA to include the witnessing of performance tests as an independent third party on the steam turbine, the diesel engines and the heat recovery steam generator.

Approval by the Ministry of Finance, the Economy and Investment to cover costs was granted on 27 November 2012. These amounted to €3,465 and €13,491 for the review of root cause report and the witnessing of performance testing respectively.

Chapter 9:

ALLEGATIONS BY THE OPPOSITION

- 1. ALLEGATION OF SERIOUS FAULTS DURING TESTING AND IMPACT ON PLANT'S LIFETIME**
- 2. ALLEGATION THAT EMC PROJECT TEAM WAS ORDERED OFF SITE**
- 3. ALLEGATION THAT BWSC LOCKED POWER STATION COMPUTERS**

On 5 November 2012, Opposition's MP Joe Mizzi called at the NAO and requested the Auditor General to, with immediate effect, investigate the EMC DPS project implementation in view of the faults that had materialised during the testing phase. Hon. Mizzi opined that, contrary to what EMC was stating publicly, these incidences could not be considered 'normal' and may have a negative impact on the plant's lifetime. He also alleged that he was in receipt of information from a reliable source that, at various instances during the implementation phase, BWSC personnel ordered the (EMC) Project Team members off site. NAO investigated both allegations.

1. ALLEGATION OF SERIOUS FAULTS DURING TESTING AND IMPACT ON PLANT'S LIFETIME

Opposing perspectives were held on the damages sustained by the BWSC plant during testing, and the repercussions that these damages would have on the longevity of the plant. The Opposition alleged that the plant was experiencing more than what could be considered as normal 'teething problems' and that the damages had seriously compromised the plant's lifetime, rendering it 'second-hand'. On the other hand, EMC refuted these allegations, claiming that such problems were expected with projects of this nature and insisted that subsequent repairs carried out did not in any way impinge on the plant's lifetime. Moreover, EMC stressed that it had requested BWSC to not only effect the necessary repairs but to also provide a root cause analysis of the damages. Such analysis would help determine the reason(s) leading to the damages and ascertain whether repairs carried out restored the plant to its original state. EMC had also insisted that it would only allow performance testing to resume once a full root cause analysis was provided, which report was to be subsequently reviewed by its independent technical consultants, and the Corporation was satisfied with the repairs undertaken. In fact, prior to the recommencement of performance testing, EMC, as a measure of good practice, had engaged specialist independent consultants DNV KEMA to review the findings of the root cause report submitted by BWSC, advise EMC on the repairs carried out and monitor the performance tests undertaken post repairs.

Due to the conflicting stances taken, NAO sought to verify whether the Delimara BWSC extension had sustained any damages that would actually compromise the plant's lifetime. To this end, NAO solicited the opinion of its technical expert so that

the Office would be in a position to express an opinion on this issue. EMC's stand, namely that the repaired plant was to be considered 'as new', was to a degree corroborated by NAO's expert who opined that if the repairs, "*have been done as they should*", then the plant's longevity was not compromised. Therefore, whether the plant's lifetime was compromised, or not, depends on whether the Corporation had, through the root cause report submitted by BWSC and the opinion expressed by its independent technical advisers DNV KEMA, determined the cause of the damage and was satisfied with the repairs carried out and any preventive remedies taken. Asked whether EMC can get an assurance that repair means 'as new', NAO's technical expert stated had repairs been carried as should, "*then the answer is yes. For example, if the broken blades on the turbine are replaced with new ones, then one can say that the turbine is as good as new. EMC needs to understand what damage was caused by the broken strainer and to satisfy themselves that the repairs were carried out correctly.*" Requested to comment on EMC's rebuttal that due to the faults that have occurred components had their lifetime compromised, NAO's technical expert was of the opinion that, "*EMC are correct. If the repairs/replacements have been done as they should have been done, then there is no reason to assume that the lifetime should be less than 'as new'. After all, when machines are refurbished, their expected 'new' lifetime is often the same as the original one.*"

In view of the fact that Enemalta, through its appointed technical consultants DNV KEMA, had accepted the root cause analysis and repairs by authorising the continuance of the performance tests, the plant is to be considered as having been repaired as required. Taking into consideration the expert advice sought by this Office, this would indicate that the longevity of the plant was not compromised and that the plant as repaired is to be considered as being in 'as new' condition.

2. ALLEGATION THAT EMC PROJECT TEAM WAS ORDERED OFF SITE

This Office thoroughly investigated the allegation that BWSC ordered EMC personnel off site. During a preliminary meeting held in November 2012 with EMC's Chairman, Chief Technical Officer and Chief Operations Officer, NAO asked whether the EMC Project Team were ever ordered off site by BWSC. All three EMC senior officials replied in the negative.

EMC subsequently provided NAO with a declaration, duly signed by Manager Projects (Electrical), which corroborated the stand taken by these officials. EMC contended that relations between BWSC and EMC operations personnel had been deteriorating during the period of the first engines start in December 2011 and later on in May 2012 when the plant was being readied for the start of the demonstration tests. At the time, the plant was experiencing considerable teething problems and although these were considered normal, especially during the early testing stages, BWSC personnel and their subcontractors were under pressure from BWSC management to solve these issues. To make matters worse, EMC employees

deployed on site, but not forming part of the Project Team, were observing the daily activity and posing a number of queries directly to BWSC personnel. Although initially tolerated, BWSC personnel started to regard such activity as an unnecessary disturbance. The fact that EMC personnel started to congregate in groups around BWSC personnel augmented such intrusions, leading to instances where EMC operations personnel were instructed to move away in order to let the contractors concentrate on their activities.

Notwithstanding such incidents, EMC Manager Projects insisted that BWSC's behaviour towards the members of the Corporation's Project Team was completely different. The Project Team enjoyed complete access to all activities on site as well as to the contractor's personnel. In the meantime, EMC operations personnel were verbally instructed to pass any queries they may have to EMC's Project Team who, if necessary, would then refer such queries to BWSC.

According to EMC Manager Projects, as the amount of technical issues started to decrease, relations improved and BWSC dedicated more of their time in showing EMC personnel the operational requirements of the plant. EMC operations personnel were gradually increasingly involved in the operation of the plant, gaining enough confidence to the point where they could conduct any plant operation unaided. EMC emphasised the fact that during the latter testing stages, particularly during the period preceding the tests on completion, up to, and including the reliability test run period, EMC personnel were operating the plant both in conjunction with, as well as under the supervision of BWSC, with input provided by all levels within the Operations section.

In NAO's opinion the affirmation issued by EMC appears to be plausible in that, while the allegation was not totally discredited, clarifications as to who was instructed off site and the reasons for such action were provided. Furthermore, EMC insisted that the Corporation's Project Team had complete access to all activities.

Notwithstanding EMC's declaration, in November 2012, NAO requested a list of the members forming part of the EMC Project Team. All the employees indicated by the Corporation as forming part of the Corporation's EMC's project team were requested to call at the NAO offices and, individually, make a sworn statement describing their experiences with regard to this allegation. All thirteen members made a sworn statement. Without exception, all declared that they had never been ordered off site by BWSC personnel or any other non-EMC personnel.

NAO checked the composition of the Project Team and, on 14 November 2012, requested evidence proving that the list of project team members as supplied by EMC was exhaustive. On 20 November 2012, EMC furnished NAO with a set of documents in relation to the thirteen project team members that consisted of the Performance Agreements and three payroll sheets covering three different payroll periods for 2012. Supplementing these documents was a covering letter issued by Chairman EMC providing for clarifications in relation to the payrolls. Reference was

made to the payroll code '101P' which was confirmed by the Officer in charge Payroll as being the code for the Generation Project Section. Further to this, Chairman EMC indicated that since the Payroll Reports cover other sections, the names of EMC personnel who are unrelated to the DPS extension have been deleted from the list submitted to NAO.

Consolidation of the three Payrolls resulted in all thirteen members of the Project Team list as submitted by EMC featuring, in one month or another, in EMC's payroll. Some featured in two payroll reports. However, it transpired that:

- a. there was no conclusive evidence that the Project Team comprised solely and exclusively the thirteen engineers listed. The Payrolls submitted listed three other EMC employees also under the designated category. When questioned on the matter, EMC Chairman explained that two were engineers assigned to the interconnector project and the third was the Personal Assistant to the Chief Operations Officer (COO).
- b. there was no conclusive evidence that the lists covered in the three Payrolls comprised the entire Project Team.

The three EMC employees listed in the payroll but allegedly not part of the Project Team were requested by NAO to declare under oath whether or not they (a) formed part, (b) form part, or (c) never formed part of the Project Team. All three declared that they had never formed part of the Project Team.

Furthermore, the COO EMC provided NAO with an endorsed organisation chart, indicating the composition of the Project Team from 2011 to 12 December 2012 (endorsement date).

NAO looks askance at the fact that an organisation such as EMC should not be in a position to supply a single official document proving the composition of a defined team of workers (such as a Project Team). In absence of documented evidence proving beyond any doubt the composition of the Project Team, the effectiveness of the entire exercise undertaken by NAO remains uncertain. However, NAO feels that EMC Chairman's explanation, namely that the personnel asked by BWSC to leave the site were engineers forming part of EMC personnel but not forming part of the Project Team, is plausible.

3. ALLEGATION THAT BWSC LOCKED POWER STATION COMPUTERS

On 26 November 2012, Opposition MP Joe Mizzi alleged in Parliament that BWSC personnel had locked the plant's computer systems, effectively disabling the power station extension, due to a dispute with EMC over the testing procedure. The dispute arose after the repaired steam turbine was installed and the power station was switched on. Apparently, EMC wanted the reliability tests to start afresh, while

BWSC wanted to resume the tests from when these were halted following the fault in the steam turbine. As a result, BWSC personnel locked the computers and, once again, turned off the extension plant.

Following media coverage of this allegation made in Parliament, EMC issued a press release in order to clarify the situation. EMC stated that the Corporation had requested a full analysis report from BWSC of the fault leading to the damage to the turbine, analysis of the broken rotor blade and the root cause of the failure of the strainer. Although BWSC did submit a report, EMC considered this a preliminary report rather than the detailed analysis expected. As a result, EMC did not allow further performance tests to continue until BWSC submitted a comprehensive report as required by the Corporation, which was to be also reviewed by DNV KEMA, the specialised external consultants engaged by EMC.

Following EMC's decision not to proceed with the performance testing pending the satisfactory submission from BWSC, the latter placed the plant in a state of "*short term preservation*". In effect, this meant that the fuel system in the engines was flushed with gasoil, all silos emptied, and the plant put in a safe shut down state. Furthermore, in order to avoid any inadvertent operation of the plant by EMC employees, since the plant was no longer manned by BWSC supervisory personnel, the control screens and keyboards located in EMC's control room were temporarily disabled. The computers that control the plant remained fully functional and were not switched off. According to EMC, this was exactly the same action which was taken by BWSC when testing was last postponed following the damage to the steam turbine, and was considered normal procedure intended to protect the plant prior to its handing over to EMC.

In view of the technical nature involved, this Office sought the advice of its technical expert who opined that such preventive measures are standard procedures in such circumstances.

Chapter 10:

CONCLUSION

As from early October 2012, through parliamentary interventions and media reports, the Opposition had alleged that the Delimara BWSC extension was experiencing a considerable number of faults, which impinged on the lifetime of the plant. At the request of Opposition MP Joe Mizzi, the Auditor General investigated the main allegations being made, namely that:

- a. damages to various components of the plant as a result of defects and faults during the testing phase would have a long-lasting effect in that they impinged negatively on the expected life of the plant;
- b. at various instances during the implementation phase BWSC personnel ordered EMC's project team members off site; and
- c. BWSC personnel had locked the plant's computer systems, effectively disabling the power station extension, because of a dispute with EMC over the testing procedure.

Following a detailed analysis of all information made available to NAO in connection with this investigation, and with due consideration to the technical advice obtained, this Office came to the following conclusions:

- With regard to the allegation made that the lifetime of the power plant was compromised due to damages sustained during testing, on the basis of the advice of its technical expert, NAO opines that since the repairs were conducted in line with EMC's expectations and certified by its external consultant (DNV KEMA), the claim of compromised lifetime cannot be substantiated.
- In view of EMC's version of events and the substantiating evidence produced, the allegation concerning the project team ordered off site is plausible in that, while the allegation was not totally discredited, clarifications as to who was instructed off site and the reasons for such action were provided. Furthermore, EMC insisted that the Corporation's Project Team had complete access to all activities. Nonetheless, NAO looks askance at the fact that an organisation such as EMC was not in a position to supply a simple official document proving the composition of a defined team of workers (in this case the Project Team).
- The third allegation, that following the dispute on the testing procedure BWSC locked the power station computers, is upheld by NAO. However, from the clarifications provided by EMC and NAO's technical expert, this is normal in such circumstances and forms part of damage preventive measures taken by the contractor.

Due to the dynamic environment in which the investigation was conducted, certain issues emerged during the time in which NAO was carrying out the investigation. For this reason, NAO widened the scope of the investigation and in addition to the above-mentioned allegations also investigated:

- a. faults and damages to plant, including damage to the flue gas desulphurisers, engine leaks, the spillage of sodium bicarbonate, and damages in a cable which led to the tripping of the steam turbine;
- b. the root cause report submitted by BWSC of damages to the strainer and steam turbine;
- c. the issue of partial taking over;
- d. claims and counter-claims for delay and liability charges by EMC and BWSC;
- e. status of the maintenance agreement; and
- f. the appointment of EMC consultant DNV KEMA

With regard to the faults and damages to the BWSC plant, NAO thoroughly investigated and reported on every fault which was brought to the attention of this Office, or that emerged during the investigation. In view of the expert advice sought, NAO concluded that with regard to faults and damages to the BWSC plant:

- the FGD incidents do not appear to have been of major technical concern. NAO opines that the problem of torn filter bags was adequately addressed by BWSC. EMC is satisfied with the outcome.
- the problem of coolant water leakages in engines has never been entirely solved. Although partly addressed through the change of cylinder heads and sealing rings, the latest indications are that the problem is the result of manufacturing defects, in which case sub-contractor Wartsila can rectify.
- the spillage of sodium bicarbonate resulted during the disposal process due to a malfunction in the limit switch. Concerned whether a system relying on just one limit switch was 'fail safe' enough, this Office requested expert advice on this issue. In view of the advice given, NAO concludes that the system was not 'under-designed', in that reliance on one limit switch should not present any serious concerns. The fact that the incident resulted during the high flow rate testing is deemed as circumstantial and not a causation factor. Given that the system has a manual over-ride switch that halts the flow should the limit switch fail, NAO opines that EMC should, in future, avoid such incidents by better monitoring the sodium bicarbonate disposal process and in case of limit switch failure intervene in a timely manner.
- the tripping incident, in which the steam turbine tripped causing damage to the emergency stop valve was not due to faults in the BWSC plant. The fact that the ESV was damaged in this incident was purely circumstantial. Given that the damage to the ESV was established and remedied under warranty conditions, there does not appear to be further reason for concern.

In view of the damages sustained by the plant during commissioning, EMC demanded that, prior to accepting the repairs and taking over the plant, a detailed report is to be forwarded by BWSC to the Corporation. The main reason for this was EMC's insistence to ascertain that the repairs conducted *de facto* restored the plant to an 'as new' condition and that EMC had reasonable assurance that the incidents would not reoccur. Only when satisfied with the root cause analysis submitted and its review by EMC's independent consultant DNV KEMA did EMC accept the repairs and take over the plant. NAO deems that this approach at protecting the interests of the Corporation and its investment is commendable.

Due to mounting media pressures and allegations that the plant had sustained damages that would impinge on its lifetime, and in view of the technical expertise required, EMC opted to engage an independent technical consultant to review the steam turbine failure report. EMC deemed it necessary to extend the assignment to include the witnessing of performance tests on the steam turbine and the diesel engine. Although the engagement of DNV KEMA was made through a direct order, the prior approval of the Ministry of Finance, the Economy and Investment was sought. NAO deems the decision to engage an independent technical consultant prudent, since apart from providing assurance to the Corporation, it is also indicative of transparency.

The possibility of partial taking over was another issue that was of concern, more so due to the liquidated damages sought by EMC and possible counter-claims for delays by BWSC. Regarding the possibility of EMC engaging in partial taking over, the Corporation consistently underlined its reluctance to take over part of the works since this could possibly lead to additional operational, technical or legal risks. EMC maintained its position that the whole of the works would be taken over following the successful completion of testing of the whole plant. BWSC was not in agreement and insisted on the partial taking over of the eight diesel engines, excluding the steam turbine. In essence, the issue of partial taking over should have been superseded by 14 December 2012, the date of taking over of the whole plant. However, the legal interpretation and subsequent positions taken by EMC and BWSC at the time of reporting remained unsolved. The possibility of going to arbitration exists although, if resorted to, arbitration will now take place in the United Kingdom instead of Malta.

Although an outline proposal for a spare parts and maintenance agreement was included in the contract signed with BWSC for the Delimara extension this was never finalised. Since then, the Corporation's position has changed and negotiations between the parties fell through. In view of the considerable foreseeable changes in the generation of energy, EMC has now opted for a shorter one-year maintenance agreement with Wartsila, with an option to extend the agreement to two years. At the time of concluding this report, this agreement was endorsed by the Director of Contracts but was pending the signatures of Wartsila and EMC. NAO deems that EMC was justified in sourcing other options for the maintenance of the plant.

In view of the above and the expert advice obtained, it cannot be said that the plant has serious faults. Despite the fact that not all defects have been fully resolved, whether major or minor, these have or are being dealt with. Moreover, there does not appear to be enough evidence to suggest that EMC was hasty in the taking over process.

APPENDICES

Appendix 1:

Details of Hon. Mizzi's intervention during the House of Representatives' sitting on 16 October 2012

IL-#DAX-IL PARLAMENT

Seduta Nru. 509

It-Tlieta, 16 ta' Ottubru, 2012

ONOR. JOE MIZZI: Sur President, kif jaf il-poplu Malti u Għawdx, bħalissa hawn instabilità kbira fil-pajjiż, instabilità kemm mill-aspett demokratiku, jiġifieri fl-ogħla istituzzjoni tal-pajjiż, kif ukoll fil-pajjiż iġenerali. Sfortunatament il-Gvern immexxi mill-Partit Nazzjonalista minflok qed jara li fejn hemm dubji jipprova jneħħihom, qed jagħmel il-kontra. Barra minn hekk, fejn qed ikun hemm affarijiet mhux mexjin sew u l-poplu stess jistaqsi x'inhu jiġri, qed jaħbi u l-mezzi tax-xandir qed jużahom bħala propaganda u jgħid kontra dak li qed isir.

Illum se nsemmi xi haġa serjissima, xi haġa li se taffettwa lill-poplu Malti u Għawdx kollu, kemm mill-aspett ta' saħħa kif ukoll mill-aspett finanzjarju, cioè mill-ispejjeż li qed jagħmel tajjeb għalihom kawża tan-nuqqasijiet li għamel dan il-Gvern. Kif jaf il-poplu Malti u Għawdx, ftit jiem oħra, wara li r-*reliability test run* tal-impjant tal-estensjoni għada tal-BWSC ġewwa Delimara jiġi fi tmiemu, din se tgħaddi f'idejn l-Enemalta. Meta wieħed jikkonsidra l-fatt li dan kien proġett kapitali u infrastrutturali ta' skala konsiderevoli u fuq livell nazzjonali, huwa importanti u mistenni li qabel tgħaddi f'idejn l-Enemalta din l-estensjoni tiġi awditjata minn awdituri indipendenti u professjonali u dan kemm fir-rigward ta' ċertifikazzjoni ta' validità tar-*reliability test run* kif ukoll fir-rigward ta' ċertifikazzjoni ta' effiċjenza u ta' emissjonijiet. Dan sabiex jiġi aċċertat li ċ-ċertifikazzjoni tkun waħda aċċettabbli għall-poplu Malti kif ukoll għall-Kummissjoni Ewropea.

Jien nagħmel enfasi li l-ebda parti jew naħa li kienet involuta fl-investment, fix-xiri, fis-servizzi, fil-kostruzzjoni jew fil-manutenzjoni m'għandha tiġi involuta f'dan l-awditjar. Dan qed ngħidu minħabba l-possibilità ta' konflitt ta' interess. Però l-fatti jindikaw li l-affarijiet mhux qed isiru bis-serjetà meħtieġa. Infakkar li nhar l-Erbgħa, 26 ta' Settembru ta' din is-sena, il-Ministru Tonio Fenech kien żar Delimara u wara għamel konferenza stampa li fiha qal ċerti affarijiet li ma kenx korretti. Din hija riflessjoni ta' nuqqas ta' serjetà u integrità. Dakinhar il-Ministru tenna li l-estensjoni tal-*power station* kienet għaddejja minn *full power test run* u qed tlaħħaq il-produzzjoni massima ta' 149 megawatt. Ir-*reliability test run* ma jkunx *full power* il-ġurnata kollha kif ta x'jifhem il-Ministru. Matul il-lejl erbgħa minn tmien makni kienu qed jitwaqqfu. Matul dan il-ħin tekniċi tal-BWSC megħjuna minn ħaddiema tal-Korporazzjoni Enemalta qed jagħmlu xogħol ta' manutenzjoni u tiswija fuq l-impjant li jkun wieqaf. Xi makni għad għandhom problemi li għadhom ma ġewx solvuti u dan huwa ksur serju ta' prattiċi normali ta' *reliability test run* li jitfa' dubju kemm dan it-test huwa validu.

Dakinhar il-Ministru Fenech qal ukoll li l-*full power trial run* bdiet ftit ġimgħat ilu, lejn nofs Settembru. Però hawnhekk ikun tajjeb li wieħed ifakkar li dan it-test *run* suppost kellu jibda fil-bidu ta' Ġunju li għadda, jiġifieri l-provi bdew tliet xhur tard. Fil-verità l-Korporazzjoni Enemalta ma ħallietx il-provi jibdedw minħabba l-problemi fl-impjant li wħud minnhom huma serji u għadhom ma ġewx solvuti. Dakinhar il-Ministru wkoll qal li l-emissjonijiet huma 20% inqas mil-limiti imposti mill-*environmental permit conditions* maħruġa mill-MEPA. Kieku l-Gvern Nazzjonalista għażel il-gass

naturali minflok il-*heavy fuel oil* l-emissjonijiet kienu jkunu ħafna inqas u ma kien ikun hemm bżonn ebda spejjeż f'dak li għandu x'jaqsam mal-*exhaust gas abatement*. Il-Ministru ma semmiex l-ammonti kbar ta' skart tossiku li tipproduċi din is-sistema fl-impjant tal-BWSC u l-irmied u t-trabijiet tossiċi li għadhom jaħrabu mill-impjant meta l-iskart ta' din is-sistema jitgħabba fil-*containers*.

Il-Ministru Fenech tenna wkoll li ż-żidiet fil-prezz taż-żejt matul din is-sena kienu ħafna akbar minn dak li gie ffrankat minħabba l-*efficjenza* għolja tal-impjant il-ġdid. U hawnhekk lill-Ministru ngħidlu: Kieku l-Gvern Nazzjonalista investa f'impjant li jaħdem bil-gass minflok bil-*heavy fuel oil* – kif fil-fatt kellu jsir – il-prezz biex jiġi generat l-elettriku kien ikun ħafna orħos għaliex il-gass naturali huwa ħafna orħos mill-*heavy fuel oil*. Il-Ministru qal ukoll li l-Gvern diġà zied is-sussidju tal-Korporazzjoni Enemalta b'€25 miljun din is-sena u dan għamlu biex jassigura li t-tariffi ma jogħlewx. Il-Ministru qed jgħid ukoll li hemm mnejn li dan is-sussidju jkollu jiżdied aktar minħabba l-prezzijiet dejjem jogħlew taż-żejt. Hawnhekk ta' min jgħid li t-*taxpayers* Maltin ġew mgħobbija bis-sussidju ta' €25 miljun lill-Enemalta minħabba n-nuqqas ta' vizjoni tal-Gvern Nazzjonalista li għażel il-*heavy fuel oil* minflok il-gass naturali li, kif diġà għedt, huwa orħos u aktar nadif.

Is-sussidju lill-Enemalta ma kienx ikun neċessarju kieku l-Gvern investa fil-gass naturali. Ikun tajjeb li ngħid li dakinhar ironikament, fl-istess ġurnata li kien qed jittkellem il-Ministru, kien hemm konsulenti barranin li żaru l-*power station* ta' Delimara u kienu qed jinvestigaw il-possibbiltà li l-impjant il-ġdid tal-BWSC jiġi modifikat biex jibda jaħdem bil-gass naturali minflok bil-*heavy fuel oil*. U hawnhekk tajjeb ngħid li biex dan issa jinqaleb għall-gass, ovvjament hemm stima kbira ta' 'l fuq minn €60 miljun imma kieku dan sar qabel, din ma konniex neħluha.

Dakinhar il-Ministru Fenech kien semma li kien hemm xi problemi żgħar fis-sistema tal-*abatement* tal-emissjonijiet li kkawżaw xi dewmien. Kien qal ukoll li dawn issa ġew solvuti. Fil-fatt is-sistema tal-emissjonijiet kellha u għad għandha bosta problemi. *Leakages* minn din is-sistema komposti minn irmied u trabijiet tossiċi kontaminati b'*sulphur* u elementi perikolużi oħra għadhom iseħħu regolarment b'detriment għall-ambjent tal-ħaddiema u l-impjant innifsu. U biex forsi ma jaħsbux li jien qed nivvinta, se npoġġi ritratti fuq il-Mejda tal-Kamra, liema ritratti ġew meħuda ftit granet ilu biex jikkonfermaw dak li qed ngħid jien. Nispera li l-mezzi tax-xandir jieħdu kopja ta' dawn ir-ritratti ħalli l-poplu jkun jaf – mhux qed ngħid dan biex il-poplu jallarma ruħu - għalxiex deħlin, fiex ninsabu fil-qasam tal-enerġija, b'mod speċjali b'din l-estensjoni l-ġdida li tant ftaħar biha l-Gvern Nazzjonalista. Il-Gvern qal ħafna diskors fis-sens li se jonqsu l-ispejjeż imma bil-mod kif qed jiġru l-affarijiet jidher li għandna problemi serji.

Hawnhekk nerġa' nfakkar li meta sar il-proċess ta' 30 ġurnata magħruf bħala *r-reliability test run* fejn jiġi ċċertifikat l-operat tal-impjant skont kriterji stabbiliti – u hawnhekk ngħid li kważi wasal fi tmiemu – instab li l-ħsara sostanzjali giet ikkawżata fl-*isteam turbine*. Dan huwa impjant li jikkonsisti minn tmien makni *diesel* u *steam turbine* waħda. Li ġara kien li filtru fil-linja tal-*isteam* li jkun dieħel fit-turbina b'xi mod tkisser. Il-bicċiet tal-filtru ngarru mill-*isteam* għal ġewwa t-turbina fejn b'konsegwenza t'hekk giet ikkawżata l-ħsara. Meta lbieraħ filgħodu nfetħet it-turbina nstab li giet ikkawżata ħsara sostanzjali fil-parti ta' quddiem tat-turbina minn fejn jidhru l-*isteam* u dan ma kienx l-uniku episodju li vvizzja l-proċess tar-*reliability test run* tal-impjant. Matul il-proċess ammonti sostanzjali ta' trab u rmied tossiku baqgħu jaħrabu mill-impjant fejn f'numru ta' okkażjonijiet ħaddiema tal-Korporazzjoni Enemalta tqabbdus saħansitra jimpalaw kwantitajiet sostanzjali ta' dan it-trab u rmied tossiku li jkun ħarab mill-impjant. Barra minn hekk, matul il-proċess bil-lejl kienu jieqfu numru ta' makni *diesel* biex isir xogħol ta' manutenzjoni fuq uħud minnhom. Bl-għajjnuna tal-ħaddiema tal-Korporazzjoni Enemalta li kienu jidhru apposta xogħol bil-lejl, tekniċi tal-BWSC biddlu numru ta' *cylinder heads* tal-makni *diesel* li bdew jitilfu ammont ta' *cooling water* waqt li jkunu

qegħdin jaħdmu. Dawn huma makni godda li huma *state of the art*! Suppost din hija sistema li hija *state of the art*! F'din is-sitwazzjoni qegħdin.

Fl-aħħar nett ikun tajjeb li ngħid ukoll li haddiema tekniċi tal-BWSC kemm-il darba daħlu bil-lejl sabiex iwettqu xogħol ta' manutenzjoni fuq il-makni weqfin mingħajr il-preżenza ta' rappreżentanti tal-Korporazzjoni Enemalta u allura hadd ma jkun jaf x'tip ta' xogħol ikun sar. Din mhijiex serjetà u xi hadd irid jerfa' r-responsabbiltà tagħha. Irid jingħad ukoll li oriġinarjament il-proċess tar-*reliability test run* kellu jibda fil-bidu ta' Ġunju li għadda imma minħabba numru ta' problemi importanti li żviluppaw fuq l-impjant il-proċess ittardja bi tliet xhur u din kienet indikazzjoni ċara li xegħlet il-bozza l-ħamra.

Sur President, jien se nagħmel numru ta' mistoqsijiet u nispera li min hu responsabbli jirrispondihom u lill-poplu Malti jinformat, mhux kif ġara l-ġimgħa l-oħra meta tajt ċerta informazzjoni dwar din is-sitwazzjoni u l-*media* lokali ħbietha u ma tkellmitx meta hemm dawn il-konsegwenzi kbar li se jkollu jbatihom il-poplu Malti u Għawdxu u indirettament se tiġi affettwata l-industrija. Jien nistaqsi ħalli l-affarijiet isiru kif suppost. Wara kollox, aħna l-membri tal-Oppożizzjoni li qed nagħmlu mhux biex inkunu kkritikajna biex niggwadanjaw politikament. Aħna nikkritikaw biex l-affarijiet isiru sew u biex min hu responsabbli jerfa' r-responsabilità. U l-poplu għandu dritt ikun jaf l-affarijiet meta jiġi biex iħallas.

Issa jien nixtieq nistaqsi: X'inhuma l-parametri li jiddeterminaw jekk ir-*reliability test run* kien aċċettabbli jew le? Qed nistaqsi dan fl-isfond li dawn it-testijiet waslu biex jiġu konklużi. Min jiddeciedi jekk il-parametri stabbiliti ġewx sodisfatti? Ġew imqabba esperti indipendenti biex jiċċertifikaw li l-proċess ta' dan it-*test run* kien tassew validu? Meta wieħed jikkonsidra d-difetti serji fl-impjant tul dan it-*test run*, *fosthom leakages* sostanzjali ta' trab u irmied tossiku mill-impjant, tibdil ta' numru ta' *cylinder heads* tal-makni diesel u xogħol ta' manutenzjoni mill-haddiema tekniċi tal-BWSC bil-lejl waqt li parti mill-impjant ikun wieqaf u issa spiċċajna bil-ħsara fuq l-*isteam turbine*, kemm jista' jiġi aċċertat li dan il-proċess ta' dan it-*test run* kien verament validu u skont il-prattiki normali u mhux ivvizzjat?

Kemm jista' jiġi aċċertat li ma teżistix kollużjoni bejn il-BWSC u uffiċjali għoljin Maltin sabiex jiġi faċilitat dan il-proċess, sabiex ma jithammarx wiċċ xi hadd involut minħabba dan il-kuntratt kontroversjali jew problematiku? Għalhekk f'isem il-poplu Malti u Għawdxu ngħid li l-poplu Malti għandu dritt għar-risposta għal dan kollu mingħajr l-ebda skuża. Din hija sitwazzjoni mwiegħra. Kulhadd jaf li fil-qasam tal-enerġija f'pajjiżna għandna problemi serji, imma wara dawk il-kontroversji kollha li kien hemm biex giet magħżula din is-sistema - li, nerġa' ngħid, tniġġes, mhijiex effiċjenti u li se tkun qed tiswielnha ħafna spejjeż biex inħaddmuha minkejja li pingewha bħala l-aqwa sistema - qed insibu li l-affarijiet mhumiex kif qalulna. Allura min se jerfa' r-responsabilità għal dan? Xi hadd irid jerfa' responsabilità u xi hadd irid ikun *accountable*. Jien nagħmel dak kollu possibbli, fil-pożizzjoni tiegħi, biex min ikun responsabbli jagħti rendikont ta' għemilu għax ma jistax ikun li l-poplu Malti jiġi mitlub biex iħallas it-taxxi, jiġi mitlub biex jagħmel is-sagrifici meta haddieħor kapriċċjożament, biex forsi xi hadd idañħal il-flus fil-but, biex forsi xi hadd isir sinjur, jiġi jaqa' u jqum mill-interess ta' pajjiżna. Ma jistax ikun li dawn l-affarijiet jibqgħu għaddejnin qisu mhu qed jiġri xejn u nispera li l-mezzi tax-xandir jagħtu kas ta' dak li għedt jien.

Sur President, jien se nqiegħed aktar ritratti fuq il-Mejda tal-Kamra biex nuri li dak li qed ngħid jien hija l-verità. Se nqiegħed ritratti li juru t-turbina bil-ħsara u biex nuri wkoll li aħna ma niġux nitkellmu f'dan il-Parlament biex nitfgħu t-tajn fuq xi hadd imma niġu nitkellmu biex l-affarijiet isiru kif għandhom isiru, u ma nitwikkewx b'xi haġa u niċċertifikawha li hija tajba għal pajjiżna meta ma tkunx. Affarijiet bħal dawn ma nistgħux naċċettawhom u jien għalhekk qed nitkellem issa, qabel xi

ħadd imur u jiffirma li l-affarijiet huma sewwa. Jekk xi ħadd jagħmel hekk, għandu jerfa' r-responsabilità hu għax ma jistax jgħid li ma kienx jaf li hemm dawn il-problemi. Ħadd ma jista' jgħid li m'hemmx dawn il-problemi. Għalhekk dawn l-affarijiet qed ngħidhom illum ftit sigħat jew ftit granet qabel joħroġu ċ-ċertifikati li għandhom joħroġu. L-affarijiet għandhom isiru bis-serjetà.

Sur President, l-affarijiet qed isiru bil-ħabi kif sar rigward il-kuntratt tal-Isptar St Philip's, imbagħad wara nsibu li saru żbalji kbar li se jkollu jħallas għalihom il-poplu Malti u Għawdx. Għalhekk qed nitkellem illum qabel għada fuq din il-kwestjoni. Din hija xi ħaġa ta' importanza kbira għal pajjiżna. Il-Gvern għandu problemi fil-Parlament, għandu problemi ta' instabilità fil-pajjiż imma qed jipprova jgħatti l-affarijiet l-oħra u juri l-affarijiet qishom mexjin fuq ir-rubini. Dawn l-affarijiet mhumiex aċċettabbli f'pajjiż ċivilizzat u demokratiku. Xi ħadd għandu jkun *accountable* u għandu jerfa' r-responsabilità u, nerga' ngħid, għalhekk qed nitkellem illum, qabel ma jkun hemm il-karti ufficjali li l-affarijiet huma tajbin u effiċjenti meta fir-realtà mhumiex.

Issa jien nistenna li jekk il-Ministru jidhirlu li l-affarijiet mhumiex kif qed ngħidhom jien, joħroġ l-informazzjoni u juri lill-poplu Malti jekk hux qed ngħid il-verità jew le. Jien qed ngħid dan li qed ngħid hawnhekk mhux bi kritika, imma biex ma jkollux iħallas il-poplu Malti u Għawdx għax xi ħadd m'għamlx l-affarijiet li kellu jagħmel, għax xi ħadd ħa deċiżjoni ħżiena, għax xi ħadd ma kellux pjanijiet u għaliex xi ħadd ried jaġevola lil xi ħadd. Dawn huma l-prijoritajiet ta' dan il-Gvern u mhux l-interess tal-poplu Malti u Għawdx. Ma jistax ikun li din il-kwestjoni tiġi aċċettata, tibqa' għaddejja u qisu mhu qed jiġri xejn. Nerga' ngħid, jien nitlob lill-mezzi tax-xandir biex għada jitolbu kopja ta' dawn ir-ritratti li se nqiegħed fuq il-Mejda tal-Kamra, minkejja s-sigurtà kbira li hemm. Issa hawn mhux qed nirreferi għas-sigurtà biex ma jweggħux il-ħaddiema jew biex ma jinsterqux l-affarijiet, imma sigurtà biex il-poplu Malti u Għawdx ma jkunx jaf x'inhu jiġri bis-serjetà hemmhekk. Din hija r-realtà ta' dan il-Gvern, li jipprova jaqbad lil min jagħti informazzjoni minflok jipprova jirrangà l-ħażin li hemm. Dan il-Gvern li tant jiftaħar li hu demokratiku, kisser id-demokrazija parlamentari u qed jaħdem b'sistema ta' dittatorjat. Lill-ħaddiema tal-Enemalta ngħidilhom: Taqtgħux qalbkom, nafu li intom ħaddiema kapaċi u allahares ma kontux intom għax kieku għandna sitwazzjoni aktar imwiegħra fil-qasam tal-enerġija f'pajjiżna. Jien niringrazzja lill-ħaddiema tax-xogħol li dejjem taw. Kultant ikun hemm min iwaħħal fihom li għamlu xi sabutaġġ u jkun hemm min jitlob xi inkjesta u l-Ministru responsabbli, meta jaf li l-ħaddiema m'għamlu l-ebda sabutaġġ, jinħeba biex ma joħroġx ir-rapport tal-inkjesta li juri li min għamel l-akkuża kontra l-ħaddiema tal-Enemalta ma kienx raġel, imma din kienet gidba faħxija għax ma rriżultax li kien hemm sabutaġġ. Din hija l-verità jekk tirrispetta l-ħaddiema. Għalfejn ħadt kwazi sentejn biex toħroġ ir-riżultat li jgħid li l-ħaddiema mhux veru għamlu sabutaġġ?

Dawn huma l-affarijiet li qed jiġru f'dan il-pajjiż. Kull darba li nagħmel mistoqsija fil-Parlament jaħarbu minnha, meta suppost il-Parlament qiegħed hawn biex jiskrutinja, biex joħroġ l-informazzjoni. Min-naħa tal-Gvern jgħidu li wiegħbu ammont kbir ta' mistoqsijiet meta fil-verità r-risposti li jingħataw ma jgħidux il-verità. Dan ma jawgurax tajjeb għad-demokrazija, għat-trasparenza u għat-tmexxija serja tal-pajjiż. Min-naħa tal-Oppożizzjoni ma naċċettawx dawn l-affarijiet u ma nagħmluhomx. Aħna konna trasparenti, nibqgħu trasparenti u ngħidu l-verità. Jekk hemm problema rridu ngħidu li hemm problema, niffaċċjawha flimkien biex insolvuha u mhux inwaħħlu fil-ħaddiema tal-Enemalta.

Sur President, qabel nagħlaq irrid nitlob il-permess biex inqiegħed xi ritratti fuq il-Mejda tal-Kamra.

MR SPEAKER: Hawn permess? (Onor. Membri: Iva)

Il-permess ingħata.

ONR. JOE MIZZI: Sur President, inqiegħed fuq il-Mejda tal-Kamra:

Sett ta' 18-il ritratt li ttieħdu f'tit jiem qabel rigward it-tħaddim tal-impjant tal-estensjoni l-ġdida tal-*power station* ġewwa Delimara.

MR SPEAKER: Grazzi.

Appendix 2:

Copy of Enemalta Corporation's statement issued on 17 October 2012

Press Releases - *Latest Press Releases*

Press statement

17-10-2012

Pending the conclusion of the investigations currently being carried out by BWSC and the manufacturer of the steam turbine, Enemalta is addressing a number of statements raised by the Hon. Joe Mizzi in Parliament and reported in the media today.

The generating plant of the Delimara extension is made up of 8 Diesel engines with an aggregated electrical output of 136MW, an abatement system to reduce emissions, a heat recovery system and a steam turbine. The heat recovery system is an ancillary part of the plant which takes the heat from the exhaust of the 8 engines, transfers it to water to produce steam which in turn rotates the steam turbine to produce electricity. This system is known as combined cycle and increases the efficiency of the plant since it is using heat which normally would be discarded. The steam turbine has the capability to produce an additional 13MW of electricity when all 8 engines are in service.

One needs to stress that before Enemalta takes over the new Delimara extension, all the plant needs to go through a rigorous process of testing consisting of commissioning, reliability and performance tests. Following the completion of the commissioning and reliability tests, a fault was identified on the steam turbine stop-valve. Investigations revealed that this fault was caused by parts of the strainer, installed just in front of the steam turbine, which had dislodged. Some of these parts also passed into the steam turbine causing foreign object damage and which is currently being investigated by the manufacturer. Preparations are being made by BWSC to make good this damage in the shortest possible time. It has to be noted that all the plant is still under the responsibility of BWSC who will have to rectify the damage at their expense. In fact, Enemalta has already sought legal advice on how to safeguard its interests.

Reliability tests

The purpose of the reliability tests is to demonstrate and verify the correct operations of the plant under all commercial operation scenarios. It is not the intention of these tests to operate the plant continuously at full load. The plant is designed to be operated on a start/stop basis in order to optimize the operating efficiency while meeting the varying daily load demand. This process is inherently more demanding than continuous operations. It is part of the normal procedure that whenever generating units are shut down routine checks and maintenance are carried out.

Emissions control

Contrary to what has been reportedly stated by the Hon Mr Mizzi, it is incorrect that there have been leakages of sulphur emissions from the plant resulting in a health hazard to the personnel on site. It is however, confirmed that there have been minor discharges of sodium bicarbonate (commonly known as baking powder) which is used in the abatement process and dust from the valves of the abatement plant and the waste unloading system. These faults are being corrected and the valves are being replaced or modified. These discharges have nothing to do with the fault on the steam turbine.

Tests validity

In connection to the engagement of independent experts queried by the Hon Joe Mizzi, Enemalta has sufficient in-house expertise to properly supervise the reliability and performance tests of the new plant.

Finally it should be pointed out that the plant is still operational and has a combined electrical output of 136MW. Furthermore, contrary to the implication made by Mr Mizzi, there are no faults affecting the satisfactory operation of the abatement system which is working efficiently with emissions being significantly below those stipulated by legislation.

Communications Office

Appendix 3:

Statement issued on 21 October 2012 by the Minister for finance in his capacity as line minister responsible for EMC



DIPARTIMENT TAL-INFORMAZZJONI
DEPARTMENT OF INFORMATION
MALTA

Press Release

PR 2300

21. 10. 2012

STQARRIJA TAL-MINISTERU TAL-FINANZI, L-EKONOMIJA U INVESTIMENT

Dott Muscat jammetti li l-investiment fil-Power Station huwa kruċjali għall-ekonomija

Stqarrija b'risposta għad-Diskors ta' Dott Muscat dalgħodu

Wara snin jikkellm kontra l-investiment fl-estensjoni tal-Power Station, Dott Muscat fl-aħħar qed jammetti li dan l-investiment huwa kruċjali għall-ekonomija, l-industrija u għall-ħolqien tal-jobs.

Wara li żviluppat f'sara f'dan l-impjant, kkaġunata mill-kuntrattur u li għaliha l-Enemalta se tkun qed tfitx lill-istess kuntrattur għad-danni, fl-aħħar Dott Muscat qed jirrealizza l-importanza ta' dan l-investiment u issa qed jgħid li mingħajru pajjiżna se jsibha aktar bi tqila biex jattira l-investiment u l-postijiet tax-xogħol.

Hu proprju għalhekk li l-Gvern u l-Korporazzjoni se jieħdu l-passi neċessarji kollha biex ikun assigurat li dan l-impjant jidhol fis-seħħ fl-isqar żmien possibbli u biex il-kuntrattur igorr kull responsabbiltà ta' kull dewmien u l-ispejjeż li jistgħu jigu kkaġunati mill-istess dewmien.

Li kien għall-Oppożizzjoni dan l-investiment qatt ma sar - u wieħed kien jistaqsi minn fejn kienet se tiġi l-provvista tal-enerġija li issa Dott Muscat qed jgħid li hija mhedda.

Dott Muscat jerga' juri inkompetenza politika u amministrattiva meta jiskanta li l-Enemalta trid tmur il-Qorti biex tinforza dak li hemm fil-kuntratt! Kif jinforza l-ligi allura jekk Dott Muscat jirbaħ il-poter? Ikun ta' ġudikatur hu stess?

Il-kuntratt jipprovi għall-penali mad-dewmien u aktar minn hekk l-Enemalta qed tieħu parir legali biex l-BWSC terfa' wkoll responsabbiltà għal spejjeż li se jirriżultaw minn dan id-dewmien.

Attachments: None

Page: 1 of 1

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Appendix 4:

Details of Hon. Mizzi's intervention during the House of Representatives' sitting on 5 November 2012

IL-ĦDAX-IL PARLAMENT

Seduta Nru. 517

It-Tnejn, 5 ta' Novembru 2012

ONOR. JOE MIZZI: Sur President, illum l-Enemalta ħarget stqarrija fejn qalet li t-turbina msewwija dalwaqt tasal. Apparti din l-informazzjoni, f'din l-istqarrija kien hemm ukoll affarijiet oħra li huma inkwetanti. Waħda minnhom hija li għal dawn l-aħħar ġimgħat il-Gvern staħba wara dan il-każ; ma deherx hu imma tefa' lill-Enemalta tikkumbatti hi b'argumenti banali. F'din l-istqarrija ntqal li t-turbina ssewwiet u allura dan diġà juri li se jkollna turbina *second hand* imma l-kwestjoni inkwetanti l-oħra hija li l-istqarrija tgħid hekk:

"It will be taking over the Delimara extension only after the root cause of the failure of the strainer has been identified and addressed to its satisfaction and the satisfactory completion of the performance testing."

Hawnhekk qisu qed jingħad li ma kien hemm ebda problemi ħlief tal-*istrainer*. Dan mhu veru xejn għax sa bħalissa l-magni għadhom mitfijin u l-magna numru 8 għadha bil-problemi; qalgħulha l-*pistons* u s-*cylinder head* u għadha qed tagħmel l-ilma. Dan appart li hemm oħra li għadha dubjuża. L-istess il-*condenser*. Dan kellu, u għad għandu, xi problemi però minn dan kollu qisu ma jeżisti xejn. Kif semmejt aktar qabel hemm ukoll problema fid-*derator* però għalihom din mhi xejn. Hemm problema oħra fejn ikun hemm l-*exhaust* u fejn isir il-*filtering* tat-tniġġis li tikkawża s-sistema imma dawn il-problemi għall-Enemalta qishom mhuma xejn. Semmuli lil xi ħadd li jaqlgħulu s-*cylinder head* u l-*piston* tal-magna għax tkun qed tagħmel l-ilma u l-ilma jkun qed jidhol fis-*cylinder head* u jgħidlek li għalih din hija xi haġa normali u li l-magna hija ġdida!

Dawn l-affarijiet mhumiex aċċettabbli u jien diġà għamiltha ċara li t-test irid jerga' jsir mill-bidu u minn xi ħadd indipendenti. L-affarijiet tant kienu vvizjati u kienu qed jippruvaw jaħbuhom li se nerga' ngħid eżatt kif saru l-affarijiet. Fis-26 ta' Settembru l-Ministru mar l-Enemalta u ftaħar li l-affarijiet huma sew. Qal li kien hemm problemi żgħar u qal li r-*reliability test* kien lest. Qal ukoll li fi żmien ġimgħatejn, jiġifieri fl-10 ta' Ottubru, kellhom jiffirmaw biex l-Enemalta tieħu l-estensjoni l-ġdida f'idejha. Però meta qal dan kollu, il-Ministru kien jaf li fl-estensjoni tal-*power station* il-ġdida kienu jeżistu dawk il-problemi kbar li jien kont tkellimt u ġibt il-provi dwarhom. Fil-fatt aktar tard il-Gvern ammettihom u qabel miegħi. Meta jien rajt li kien wasal l-10 ta' Ottubru u l-Gvern se baqa' għaddej ma jitkellem xejn fuq il-problemi li hemm, għamilt ċert li ONE News, fil-11 ta' Ottubru, fl-aħbarijiet joħroġ il-problemi li hemm fl-estensjoni tal-*power station* ta' Delimara. Madankollu, minkejja li ONE News ħareġ din l-informazzjoni, ħadd min-naħa tal-Gvern jew mill-Enemalta ma tkellem.

Imbagħad, fis-16 ta' Ottubru, meta rajt li ma tawx kas u li xorta se jiffirmaw, ġejt f'dan il-Parlament u fl-Agġornament spjegajt xi problemi hemm f'din l-estensjoni, inkluż il-ħsara li saret fit-turbina. Kont poġġejt fuq il-Mejda tal-Kamra ritratti biex nuri dan u kien hemmhekk li mbagħad il-Gvern ammetta

li kien hemm hsara, imma baqa' jghid li l-affarijiet l-oħra mhuma xejn u li dik il-problema biss kien hemm. Imbagħad fit-22 ta' Ottubru l-Ministru Tonio Fenech kien ħareġ stqarrija ministerjali fejn ikkonferma dak li għedt jien dwar il-ħsarat li hemm u qal li dawn kienu *teething problems* u kollox hu solvut. Tant kollox hu solvut li dakinhar, waqt li kien qed jitkellem, il-magna numru 8 kellha l-problemi u kienet qed tagħmel l-ilma! Però xorta baqa' jinsisti li l-affarijiet huma sew!

Fis-26 ta' Ottubru, fi programm fuq ONE TV, kien hemm rappreżentant tal-Enemalta li beda jerga' jdoqq l-istess diska u qal li dawn l-affarijiet mhuma xejn. Barra minn hekk tkellem ukoll fuq l-ispejjeż u waqqa' għaż-żufjett lill-Prim Ministru għax il-Prim Ministru kien qal li BWSC se jagħmlu tajjeb għal kollox filwaqt li r-rappreżentant tal-Enemalta qal li lanqas biss għad hemm xejn u li mhux se jagħmlu tajjeb għal kollox; dak trid tidhol il-Qorti. Dawn huma affarijiet li ma jitwemmnu!

Kien jidher ċar li l-Gvern se jaċċetta l-estensjoni kif kienet, mingħajr it-turbina, imbagħad it-turbina tiġi rrangata għax għall-Enemalta l-aqwa li kienet taħdem, anke jekk minn 149MW se tiġġenera 135MW. Imbagħad il-Gvern induna li r-responsabilità se taqa' fuqu politikament u fuq xi individwi oħra li ħadu din id-deċiżjoni u għaldaqstant marru lura u m'aċċettawhiex, però xorta baqgħu jsostnu u jgħidu li m'hemmx problemi. X'jigifieri m'hemmx problemi meta ġibna turbina msewwija u f'din l-aħħar ġimgħa l-magni kienu kollha mitfijin! Mhux veru li kollox sew.

L-istqarrija li semmejt tgħid li *r-reliability test* sar u li hu aċċettabbli, però dan ma jistax ikun li hu veru! Għalhekk li għamilt jien illum hu li tlabt lill-Awditur Ġenerali biex jidhol immedjatament f'din il-kwestjoni tal-estensjoni tal-*power station* għax ma jistax ikun li hemm dawn il-problemi kollha u jiġu jgħidulek li dawn huma normali u m'huma xejn. X'jigifieri m'huma xejn? Ma jafux li jekk ma nerfgħux ir-responsabilità issa, erbat ijiem oħra se jibqa' jkun hawn il-problemi? Nerġa' nteni li jien mort għand l-Awditur Ġenerali biex jidhol fil-każ u nispera li jagħmel dan immedjatament. Mhuwiex aċċettabbli li min għamel l-*ispecifications* u għażel hu, ikun l-istess li jara u jiċċertifika li l-affarijiet huma sewwa. Hemm kunflitt ta' interess daqs kemm hemm kunflitt ta' interess f'ċerti deċiżjonijiet li ttieħdu biex għamlu ċerti affarijiet sabiex jintuza l-*heavy fuel oil* eċċ. Dak li jkun jipprova jkopri ruħu għal deċiżjonijiet li jkun ħa qabel. Dan mhuwiex aċċettabbli. Għalhekk nerġa' ngħid li għandu jkun hemm xi ħadd indipendenti li jiċċertifika hu li l-affarijiet huma sewwa għax ma jistax ikun li ngħabbu l-poplu Malti u Għawdx i b'dawn l-ispejjeż. Jien irrid li l-affarijiet jaħdmu u ma rridx inwaqqafhom, imma rrid li jaħdmu sew u mhux joqogħdu jiqfulna 'l quddiem u mbagħad irridu nerfgħu r-responsabilità u nħallsu aħna għax inkunu aċċettajnihom. Aħna rridu li l-affarijiet ikunu kif suppost.

Mr Speaker, kien dover tiegħi li f'isem l-Oppożizzjoni u fl-interess tal-poplu, meta rajt li min hu responsabbli min-naħa tal-Gvern u min-naħa tal-Enemalta qed jaħbi dawn il-problemi, niġi hawnhekk u nitkellem. U hekk għamilt. U għalhekk illum, fl-interess tal-poplu, ergajt mort quddiem l-Awditur Ġenerali biex jidhol f'dan il-każ għax ma tistax tiġi aċċettata d-dikjarazzjoni li dawn il-problemi li semmejt mhuma xejn. X'jigifieri mhuma xejn? Min hu dak l-iblah li jixtri magna ġdida li tagħmillu l-ilma, jaqla' l-*piston* u s-*cylinder head* u jgħid li mhu xejn? Jekk dan huwa aċċettabbli allura l-kumpanija li qed tagħmel dawn il-magni għandha tibda tirriklamahom hekk: Dawn il-magni jagħmlu l-ilma, taqlagħhom is-*cylinder heads* u taqlagħhom il-*pistons* qabel ma tibda tużahom! X'reklam sabiħ dan! Hawn xi ħadd li se jaċċetta li jkollu magna hekk? L-affarijiet mhux hekk isiru.

Is-sitwazzjoni hija inkwetanti għax il-Gvern qed iwebbes rasu – u qed ngħid għall-Gvern għax hu jgħid lill-Enemalta x'tagħmel u huwa responsabbli politikament – biex iħaddem din il-*power station* malajr biex taparsi l-affarijiet issa trāngaw meta fil-fatt għad hemm il-problemi. Jekk irid ikun trasparenti għandu jhalli lil min hu indipendenti jidhol u jara l-affarijiet biex daww l-affarijiet li huma difettużi ma jibqgħux difettużi u jinbidlu, mhux a spejjeż tagħna, imma a spejjeż ta' min hu responsabbli. U għalhekk qed nitkellem jien u għal xejn aktar. Din hija r-realtà u nispera li l-Awditur Ġenerali jidhol

f'dan il-każ mill-aktar fis possibbli għax fl-Enemalta hemm ħafna każi vvizzjati. Fil-fatt jien semmejt każi oħra qabel imma m'iniex se nidhol fihom illum għalkemm lill-Awditur Ġenerali llum tajtu informazzjoni fuq każ speċifiku li ilni nsemmi anke hawnhekk. Imma fuq dak nitkellmu aktar 'il quddiem. Nispera li min hu responsabbli jieħu l-passi ħalli l-affarijiet jsiru kif għandhom isiru fl-interess ta' pajjiżna. Nirringrazzjak.