Marinelive project Final Report

(Months 1-42)

Editors:

J. Prousalidis, L. Kaiktsis

Athens, October 2014
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**Publishable Summary**

MARINELIVE has been an initiative both at a national and European level, aiming at establishing a Centre of Excellence in the field of Marine Electrical Engineering at the School of Naval Architecture & Marine Engineering of the National Technical University of Athens (NAME-NTUA), as well as at building a European community of “All Electric Ship” (AES) research and technology. MARINELIVE, focusing on the AES technology, has addressed the objectives of the FP7 Transport Calls for waterborne transportation (“development of clean and efficient engines and power trains, reducing the impact transport on climate change”), thus contributing to a safe and environmentally friendly ship. In the course of MARINELIVE, the development of NAME-NTUA built upon the formation of a balanced interdisciplinary research team covering all major aspects of AES research, i.e. electric machines and grids, ship automation and control, as well as propulsion systems and prime movers. The objectives of MARINELIVE have been realized via:

1. attraction and recruitment of qualified researchers of Greek origin
2. two-way exchanges of know-how and experience with leading European Institutions
3. acquisition of equipment essential for AES research, and upgrade of current infrastructures
4. organization of international workshops and conferences, and
5. spreading excellence via a series of dissemination activities including organization of Open-Days, and participation in international exhibitions and conferences.

MARINELIVE substantially enhanced the capacity of NAME-NTUA to perform world-class research and to attract future research projects in Marine Electrical Engineering, and strengthened the School’s leading position in Naval Architecture and Marine Engineering. MARINELIVE also strengthened Europe’s industry related to “All Electric Ship” applications, and contributed substantially to the maturing of the AES technology and its adoption by the maritime industry.
Description of work performed during the project and main results

MARINELIVE Activities (Work-Packages)

- Project management (WP1) - completed
- Exchange of know-how and experience with leading EU Institutions (WP2) - completed
- Recruitment of incoming experienced researchers (WP3) - completed
- Acquisition, upgrading and installation of equipment (WP4) - completed
- Organisation of workshops and conferences (WP5) - completed
- Dissemination and promotional activities (WP6) - completed

Although the progress per work-package is stated below, in the following some representative results are cited, mainly referring to the evaluation indicators as they have been set in the MARINELIVE contract.

_Evaluation Indicators – Targets set in the contract_

The target indicators set for the first official reporting periods (i.e., in the project month 24), are as follows.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Target for the end of the project (Month 42)</th>
<th>Accomplished by the end of the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joint Publications</td>
<td>5</td>
<td>5'A</td>
</tr>
</tbody>
</table>
Joint Research Proposals submitted | 2 | 4th
---|---|---
Number of lecture series at NTUA | 8 | 8th
Attendance of planned workshops | 50 persons/workshop | >50th
| 120 persons/conference | >120th
Attendance of Open-Days | 150 persons | >150th

**Joint papers**

Since the beginning of the project five (5) joint papers have been written and presented in international fora (2 in the 1st period, and 3 in the 2nd period), see below.

**Two papers between NTUA and ETH**


**Three papers between NTUA and UCL**


Proposals exploiting the MARINELIVE network

Since the beginning of the project five (5) proposals have been written and submitted to the European Commission (3 in the 1st period, and 2 in the 2nd period), see below. One of them has been successful.

• “Retro-Ship”, submitted in December 2010 (within the framework of “Transport 2010”)
• “GOLD IRONING” submitted in January 2012 (within the framework of “Regions of Knowledge 2012”)
• “ECO-MARINE” submitted in January 2012 (within the framework of “Marie-Curie 2012”) (re-submitted as “ECCO-MATE” in November 2012; ECCO-MATE has been approved and is already in progress, , budget of NAME-NTUA: 289,000.00€).
• “e-ZERO Ship” submitted in November 2012 (within the framework of “Transport 2012”)
• “e-retr0” submitted in March 2014 (within the framework of H2020-Transport)

It is worth noting that, partially due to the added value of MARINELIVE, the NTUA research team has succeeded the approval of four research projects co-funded by European Structural funds and Hellenic National resources, namely:

1 All four proposals have been evaluated by international reviewers.
• “DEFKALION” (“THALIS” call of the Hellenic Ministry of Education): “Investigation of Electric Power Quality problems occurred in ship electric energy networks” networking researchers from all over Greece (project Coordinator: Ass. Professor John Prousalidis, budget of NAME-NTUA: 600,000.00€).
• “DC-Ship” (“ARISTEIA” call of the General Research Secretariat): “Integration of DC in ships Initiative” exploiting the MARINELIVE research capacity to marine electrical engineering issues (project Coordinator: Ass. Professor John Prousalidis, budget of NAME-NTUA: 175,000.00€).
• ECO-Marine (“SYNERGASIA” call of the General Research Secretariat): waste heat recovery (WHR) method based on applying thermo-generating units to thermal engines (main and/or auxiliary engines). The WHR is converted to electric energy, which is injected to the ship electric grid. (NAME-NTUA is a key-partner dealing with both economical and technical aspects of this application, budget of NAME-NTUA: 153,000.00€).

Thus, in total the capacity of MARINELIVE has enabled the success in the approval of 5 large scale research projects (funded by European and Hellenic National funding sources) of a total budget of 1,492,000.00 €.

*Lectures at NTUA*

Since the beginning of the project eight (8) series of long lectures have been given, all during the first period and within the frame of exchange of visits (WP2), see the list below in detail.

1st series of lectures (made by visitors from IFP)
- J. Bohbot, Presentation of “Research on CFD (0D-3D modelling) in IFPEN- Part A” November 8th, 2011.

- J. Bohbot, Presentation of “Research on CFD (0D-3D modelling) in IFPEN- Part B” November 8th, 2011.


2nd series of lectures (made by visitors from UCL)


- A. Greig: “UCL research activities on All Electric Ship”, 1st June 2012

3rd series of lectures (made by visitors from ETH-Zurich)


- K. Boulouchos: “Large vs. Small IC Engines - similarities and differences across scales”, 22nd November 2012

4th series of lectures (made by visitor on behalf of Converteam)

- M. Benatmane: “Novel Generator Technology” 13th January 2012

5th series of lectures (made by visitor from EXA Corporation)

- S. Jelic: “EXA Corporation research activities and projects”, 16th July 2012
- S. Jelic: “Thermal modeling of thermal engines”, 16th July 2012
- S. Jelic: “Thermal modeling of electric batteries”, 17th July 2012

6th series of lectures (made by visitor from Valmarine/L-3)
- O. Knutson: “VALMARINE/L-3 activities on development of IPMS for AES”, 21st October 2011

7th series of lectures (made by visitors from Wärtsilä Switzerland)

8th series of lectures (made by visitors from DCNS)
- D. Fouilly “Sea the Future: DCNS believes the Sea is the planet’s future”, 19th December 2012

Moreover, on the occasion of certain events additional lectures were given. For instance, on the occasion of the pilot web-conference held on 21st November 2013, the member of the Advisory-Steering Committee, Dr German Weisser from Wärtsilä Switzerland gave a lecture entitled:

“Current Trends in the Development of Large Two-Stroke Marine Diesel Engines in the Light of Significantly Changing Market Requirements and Environmental Regulations”

The lecture was co-organized and hosted by the Greek section of SNAME (Society of Naval Architecture and Marine Engineers)
**Milestones**

(All milestones were attained successfully as planned and described in the contract)

<table>
<thead>
<tr>
<th>Milestone Number</th>
<th>Milestone name</th>
<th>Work package(s) involved</th>
<th>Expected date</th>
<th>Means of verification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Recruitment of Incoming Researchers</td>
<td>3</td>
<td>Month 6</td>
<td>Incoming researchers sign contract with NAME-NTUA</td>
</tr>
<tr>
<td>2</td>
<td>Organisation of Workshops on Propulsion Systems and Electric Machines &amp; Converters</td>
<td>5</td>
<td>Month 12</td>
<td>Completion of first workshop series</td>
</tr>
<tr>
<td>3</td>
<td>Acquisition, Upgrading and Installation of Equipment</td>
<td>4</td>
<td>Month 24</td>
<td>Commissioning and Installation of equipment</td>
</tr>
<tr>
<td>4</td>
<td>Two-Way Exchanges</td>
<td>2</td>
<td>Month 24</td>
<td>Completion of two-way exchanges</td>
</tr>
<tr>
<td>5</td>
<td>Organisation of Workshops on Prime Movers and Automation &amp; Control</td>
<td>5</td>
<td>Month 24</td>
<td>Completion of second workshop series</td>
</tr>
<tr>
<td>6</td>
<td>Organisation of Workshops on Ship Electric Grids and Power Management Systems</td>
<td>5</td>
<td>Month 30</td>
<td>Completion of third workshop series</td>
</tr>
<tr>
<td>7</td>
<td>Organisation of AES Conferences</td>
<td>5</td>
<td>Month 42</td>
<td>Completion of AES conferences</td>
</tr>
</tbody>
</table>
Additional issues – distinctions

Months 0-24

- The official bulletin of the Society of Naval Architects and Marine Engineers (SNAME) the (mt)-magazine has referred to the MARINELIVE conference.
- The Media Publishing Riviera Maritime (RMM) has invited the MARINELIVE team to take part in the Annual Propulsion Conference organized in London on March 7-8, 2012, and had an article about MARINELIVE (March 2012 issue).
- The Greek magazines “MARITECH” and “NAFTIKA CHRONIKA” covering maritime issues have invited 4 and 1 times, respectively, the MARINELIVE team to write about the research capacity cultivated within the MARINELIVE initiative.
- The Electric Ship Research and Development Consortium (ESRDC) of the USA’s electric ship project (funded by the Office of Naval Research – ONR) has invited MARINELIVE members to attend and present MARINELIVE in the ESRDC Conference held in USA, in June 2012.
- Lloyd’s Register of UK has invited the MARINELIVE Coordinator to make a presentation of the project in the 1-day workshop organized by LR in Piraeus (Event organizer: Mr. Bernard Twomey, LR Global Head of Electrotechnical Applications).
- During the External Evaluation of the School of Naval Architecture and Marine Engineering of NTUA in March 2012, the External evaluators complimented the cultivation of the research capacity within the MARINELIVE project, stressing in particular the significance of the equipment purchased and installed.
- Invitation to participate in the “ACCeSS/AUVSI Foundation Workshop 2-4 December 2012, London, UK, on Educating Naval Engineers for the 21st Century”, co-organized by the Office of Naval Research – ONR and UCL.
- Professors Prousalidis and Kaiktsis have been invited to submit their CV’s to “Who is Who” 2012 edition.
- Greek maritime enterprises having invested in electric propulsion (especially in LNG carriers) have asked NTUA for training assistance and/or consultancy on marine electrical engineering issues.

Months 25-42

- The Greek magazine “MARITECH”, covering maritime issues, has invited 2 times, the MARINELIVE team to write about the research capacity cultivated within MARINELIVE initiative.
• Presentation to NATO Committee MCG10 dealing with releasing regulations on electrical installations in ships (STANAG-1008). On Tuesday September 10th, 2013, a presentation on “Electrical Power Quality Issues” was made after the invitation of the Organizing Committee.

• Increased networking with BV, NG3, ABS, University of Southampton, Lloyd’s Register.

• Presentation by Prof. J. Prousalidis at SNAME/Greek Section on September 19th 2013, entitled “Improving the efficiency of ship energy chain within the All Electric Ship framework”.

• Greek maritime enterprises having invested in electric propulsion (especially in LNG carriers) have asked NTUA for training assistance and/or consultancy in marine electrical engineering issues (STCW/ETO according to Manila amendment training specifications). ABS Academy has been a partner to this activity.

• Invitation to Prof. L. Kaiktsis for scientific collaboration with ETH-Zurich and Wärtsilä- Switzerland.

• The European Commission has evaluated MARINELIVE as one of the most successful REGPOT projects managing to attract other funding sources (mainly from Structural Funds), for research related to green shipping. Thus, in June 2013, in the REGPOT Workshop organized in Brussels, MARINELIVE was declared to be one of the four most successful projects based on its synergies with several projects funded within the National Strategic Reference Framework.

• A compendium on “Marine Electrical engineering knowledge” has been issued by members of the MARINELIVE team.

• Invitation to MARINELIVE team to participate in the meeting of the Industrial Advisory Board of the INOMANS^HIP (standing for INOvative energy MANagement System for cargo SHIP, webpage: [http://inomanship.eu/](http://inomanship.eu/)) EU funded project and help in the evaluation of its progress. This project is coordinated by the University of Newcastle (UK) (The meeting had originally been arranged during the TRA 2014 Conference, but it was postponed and finally took place on June 24th, 2014, during the “Electric Hybrid Marine World Expo 2014” held in June 2014, in Amsterdam- The Netherlands).
Note

In the end, a small amount of money was not spent due to several reasons. More specifically:

- In the budget of the personnel cost, a small amount of about 350.00 € was not spent. Moreover, regarding the cost of the equipment, a small amount of about 480.00 € was not spent. There is no specific reason for these discrepancies but is mainly attributed to round-up/cut-off errors on several payment expenses.
- In the budget of travels, about 17,000.00€ were not spent. This is mainly due to the fact that:
  - on the one hand some flat changes in the general travel expense policy in all public bodies in Greece.esp. referring to the eligible per diem) took place due to the austerity measures imposed
  - in the end of the project, several problems took place due to the severe striking mobilizations taken place in all universities in Greece including NTUA. More specifically:
    - there was a major difficulty (insufficient Administrative personnel) in keeping a good updated track of all travel expenses taken place in the last period. In the end, there was no sufficient time to proceed in any kind of amendment of the budget.
    - the last Conference was postponed due to Force Majeur, from November 2013 to February 2014 and not all guest speakers managed to attend it. Similarly, some members of the International Advisory – Steering Committee did not manage to participate in the concluding meetings.

However, it is underlined that the strategic plan of all travels (two-way secondments, participation in conferences and workshops etc) was completed successfully.

Nonetheless, a total amount of about 18,000.00 € is to be subtracted from the amount due to be sent to NTUA after the official completion of the project.
Expected final results and potential impacts and use (including socio-economic impact and the wider societal implication of the project)

Better Integration in the European Research Area

- NAME-NTUA has become a Centre Of Excellence (COE) in the field of Marine Electrical Engineering. This development has been based upon the formation of a balanced interdisciplinary research team in the course of MARINELIVE, covering all major aspects of the “All Electric Ship” research. The evolution of NAME-NTUA, assisted by the European collaborating Institutions within MARINELIVE, has substantially strengthened its leading position in Naval Architecture and Marine Engineering in the European Research Area. The following close collaborations enabled by MARINELIVE, have contributed towards the integration of NAME-NTUA in the European Research Area:

  - Collaboration with UCL, DCNS, L-3/VALMARINE in the area of Marine Electrical Engineering, focusing, in particular on emissions reduction of electrified ships, on deploying renewable energy sources onboard ships, on developing more efficient Power Management Systems and on cultivating the cold ironing concept.
  - Collaboration with IFPen on modelling integrated propulsion systems. Research has been mainly addressed to issues related to coupling 0-D and 3-D modelling, as well as parallel computing aspects. Moreover, another synergy has been identified during the last period, namely modelling of the ship energy system via a platform developed jointly by IFPen and NTUA.
  - Collaboration with Wärtsilä on optimizing marine prime movers. Research will address particular issues related to physical process modelling (spray, combustion and emissions formation).
  - Furthermore, increased networking has been developed between NTUA and other Institutions like BV, NG3, ABS, University of Southampton, Lloyd’s Register, DNV-GL. It is also noted, that an entire new scientific sector of joint research has been identified and substantially cultivated, namely that of tribology. Thus, a very productive
co-operation has been developed mainly among NTUA, University of Poitiers and CNRS as well as Wärtsilä

- Europe is considered the proper source of AES knowledge transfer to NAME-NTUA, the sole University establishment of Greece in the field of Naval Architecture and Marine Engineering. In addition, it is expected that this activity beyond the lifetime of MARINELIVE will strengthen Europe’s industry related to “All Electric Ship” applications, and contribute substantially to the maturing of the AES technology and its adoption by the maritime industry. MARINELIVE has reinforced the NAME-NTUA position to play a key role towards the recently successful investment in AES technology by the local maritime community, which holds about 20% of the global maritime market.

- The development of NAME-NTUA already has a positive impact on the European research and industrial Institutions, through the establishment of close collaboration with a new Centre of Excellence in the field of Marine Electrical Engineering, as well as through closer and more frequent communication with the Greek maritime industry, a significant final recipient of their research and products. On the occasion of MARINELIVE activities (especially the dissemination ones), a large network of stakeholders and manufacturers have been communicating to each other.

- While individual research activities in the AES field are now emerging, the ambition of MARINELIVE was to bring together these efforts under a unified European umbrella. This has already been accomplished through the joint activities in the form of two-way exchanges, workshops and conferences, as well as extensive interaction with the manufacturing and maritime industry. Moreover, the joint research project proposals that were submitted prove the close cooperation of a significant number of collaborators throughout Europe within MARINELIVE.

Upgrading the RTD Capacity and Capability

- The recruitment of the incoming experienced researchers has significantly improved the School’s capacity to perform research in the core areas of AES. This is proven by the number of publications and funded research projects approved.
The two-way exchanges with leading European Institutions have substantially contributed to the transfer of know-how to NAME-NTUA. This new knowledge has diffused to the student body of NAME-NTUA through the update of the offered courses, as well as through student participation in research activities, in the course of semester and Diploma projects. This has helped to meet the emerging demand for NAME-NTUA graduates with increased knowledge on marine electrical engineering issues.

The acquisition of the Grid Emulator & PMS has enabled real-time testing and validation of:

- AES-grid configuration operating in transient and steady-state conditions.
- Alternative protection schemes of the AES-grid.
- Operation of novel electrical equipment (small-scale prototype units of AES-related equipment).
- Alternative automation & control techniques, integrated in PMS.

The substantial upgrade of the NAME-NTUA parallel computational cluster enables the following CPU-demanding studies, crucial to AES operation:

- Finite Element electromagnetic field analysis of novel electric motors.
- Short- and long-term prediction of onboard electric power demands, by means of Artificial Intelligence methods.
- Analysis, identification and control of recorded Electric Power Quality events.
- Computational Fluid Dynamics based optimization studies of marine Diesel engine flow and combustion processes.

Finally, it is noted that in the last period (and during the approved extended by six-month interval) additional components have been procured, increasing even further the research capacity of the MARINELIVE team especially towards the marine tribology sector (a scientific area that was cultivated at NTUA on the occasion of MARINELIVE and emerged several synergies worldwide).

It is underlined that the equipment acquired in the course of MARINELIVE is planned to be exploited in almost all funded and non-funded research projects of the MARINELIVE research team.

**Contribution to Regional Economic and Social Development**

By developing a Centre of Excellence, NAME-NTUA has succeeded to a certain extent in increasing its potential for attracting researchers working abroad,
especially ones of Greek origin, thus partially inversing the present “brain drain”. Moreover, MARINELIVE has been the key to attract talented researchers, both young and experienced ones, to perform research in the other projects already in progress.

- The transfer of know-how from developed European countries to Greece has assisted the gradual adoption of the AES technology by the Greek maritime industry, a branch crucial for the country’s economy.
- AES technology, promoted by the MARINELIVE initiative, is inherently associated with social development, as:
  o It promotes the involvement of highly-trained personnel for operating AES-technology vessels.
  o It can provide a safe, efficient and environmentally-friendly means of waterborne transportation.
  o It contributes to lower pollutant emissions levels according to the IMO’s policy, especially in coastal areas (Emission Controlled Areas - ECA’s).

Improvement of the Future Potential of NAME-NTUA in H2020

- Building upon the expertise and the infrastructure developed in the course of MARINELIVE and the collaborations developed with leading European Institutions, NAME-NTUA has been proven to increase its potential for attracting future research projects in the field of Marine Electrical Engineering, both by initiating research efforts as a coordinator and being a reliable partner in research consortia. Further, the formation of strong European groups to perform advanced research in the area of Marine Electrical Engineering contributes towards a coordinated centralized effort, thus avoiding duplication of effort within Europe.

Project proposals in European and Hellenic or joint funding frameworks:

• “Surfing” submitted in December 2011 (proposal No FP7-314416 within the framework of “Transport 2010 FP7-SST-2012-RTD-1”) “Smart, mUltipuRpose and efficient shlp-shore commuNication Grid”. Proposal Coordinator: Prof. J. Prousalidis.
• “GOLD IRONING” submitted in January 2012 (proposal No 319912, within the framework of “Regions of Knowledge 2012-2013-1”) “smart Grid – eOLD IRONING initiative”. Proposal Coordinator: Prof. J. Prousalidis.
• Projects co-funded by the European structural funds and Hellenic National Resources: “DEFKALION” (coordinator: Prof. J. Prousalidis), “DC-Ship” (coordinator: Prof. J. Prousalidis), “TRIBO-MARINE” (coordinator: Prof. L. Kaiktsis).

**Spreading excellence, exploiting results, disseminating knowledge**

By increasing the research potential of NTUA and establishing strong links with leading European Institutions, MARINELIVE has contributed substantially towards spreading excellence in an area which is crucial for the economy of Greece and important for the entire Europe. As ships become more electrified, maritime enterprises increase their interest in the AES technology. NAME-NTUA reinforces direct connections and links to both Greek and International maritime industry, and advertises the AES concept in the course of the project activities, thus contributing towards spreading of excellence as well as in substantial investment in the AES technology, in the horizon of the next decade. It is noted that, currently, seven leading maritime enterprises located in Greece have invested in extensively electrified ships with electric motors as main propulsion engines, as in all feasibility studies these configurations have been proven the most efficient, economic and
environmentally friendly ships according to the IMO’s directives. These ships are LNG carriers which serve an ultimately useful plan, i.e. to carry an environmentally friendly fuel (natural gas). It is anticipated that by 2014 about 40 (most expensive) new-builds of this type will have been commissioned. To this end, these maritime enterprises have expressed their strong support to the MARINELIVE activities, in particular by participating in the events, by collaborating with NTUA in several research project proposals, and by assigning to NTUA feasibility studies, consulting or training (to their crew members and superintendent engineers) work. Moreover, there is a significant trend towards retrofitting sailing ships by integrating advanced electrified equipment (e.g. power electronic converters used as variable frequency suppliers to electric motors) in an effort to increase the entire ship efficiency (in terms of lower fuel consumption, smaller losses and lower emission rates).

Engagement of Stakeholders Beyond the MARINELIVE Network

Stakeholders in AES are academic and research establishments active in the area of Marine Electrical Engineering, industrial manufacturers, as well as the maritime industry. Involvement of a vast number of stakeholders was attained through the following actions:

- The project enhanced the links of NAME-NTUA with established Engineering Societies, such as SNAME (Society of Naval Architects & Marine Engineers) and RINA-IMarEST (Royal Institute of Naval Architects-Institute of Marine Engineering Science and Technology), who have demonstrated a strong support to the MARINELIVE activities.
- All identified members of the AES community have been invited to participate in the workshops and conferences of MARINELIVE, thus disseminating knowledge to the widest possible audience within the field, and spreading excellence in the area of Marine Electrical Engineering throughout Europe.
- New lasting partnerships have been initiated in the course of the above technical meetings.
- Publication of NAME-NTUA’s research accomplishments in peer-reviewed journals and international conferences further spreaded excellence to the entire AES community.
The project’s website, launched at the very beginning of the project will be maintained after the completion of the project. The website serves as a repository and information source on all aspects of the AES field.

Participation in the Posidonia International Shipping Exhibition, the premier event in the maritime field, has disseminated knowledge and promoted the AES concept to the entire maritime community. Furthermore, policy makers had the opportunity to become acquainted with the solutions offered by the AES technology.

As also indicated above, seven leading maritime enterprises located in Greece have decided to invest in extensively electrified ships with electric motors as main propulsion engines, as in all feasibility studies these configurations have been proven the most efficient, economic and environmentally friendly ships according to the IMO’s directives. These ships are LNG carriers which serve an ultimately useful plan, i.e. to carry an environmentally friendly fuel (natural gas). It is anticipated that by 2014 about 40 (most expensive) new-builds of this type will have been commissioned. To this end, these maritime enterprises have expressed their strong support to the MARINELIVE activities, in particular by participating in the events, by collaborating with NTUA in several research project proposals, and by assigning to NTUA feasibility studies, consulting or training (to their crew members and superintendent engineers) work. Last but not least, the Project Manager of MARINELIVE was invited to join the Industrial Advisory Board (IAB) of another successful EU funded project, the INOMANSHIP (standing for INOvative energy MANagement System for cargo SHIP, webpage: http://inomanship.eu/), which is coordinated by the University of Newcastle (UK). The meeting of the IAB was held in Amstererdam (The Netherlands) on June 24th, 2014 (ie just few days after the official ending date of MARINELIVE) in parallel to the Electric Hybrid Marine World Expo 2014.

Engagement of the Public at Large

The project activities involve participation of the public at large in the following ways:

- The know-how and experience gained by the NAME-NTUA team in the course of MARIVELIVE is transferred to undergraduate and graduate students through courses taught by the academic staff of the School and other collaborating
Universities. In this manner, young engineers receive state-of-the-art training in the area of Marine Electrical Engineering.

- The Open-Day events, which took place in parallel to the AES conferences and the Posidonia Exhibition (in the course of WP6), while mainly addressing the AES community, have included participation from the wide public. This has allowed the public to visit NAME-NTUA’s research facilities and become familiar with the research work performed in the School, thus increasing the public awareness of green technology for shipping and maritime applications.

As also indicated above, seven leading maritime enterprises located in Greece have decided to invest in extensively electrified ships with electric motors as main propulsion engines, as in all feasibility studies these configurations have been proven the most efficient, economic and environmentally friendly ships according to the IMO’s directives. These ships are LNG carriers which serve an ultimately useful plan, i.e. to carry an environmentally friendly fuel (natural gas). It is anticipated that by 2014 about 40 (most expensive) new-builds of this type will have been commissioned. To this end, these maritime enterprises have expressed their strong support to the MARINELIVE activities, in particular by participating in the events, by collaborating with NTUA in several research project proposals, and by assigning to NTUA feasibility studies, consulting or training (to their crew members and superintendent engineers) work.

**Project objectives for the period**

*Please provide an overview of the project objectives for the reporting period in question, as included in Annex I to the Grant Agreement. These objectives are required so that this report is a stand-alone document.*

- Exchange of know-how and experience with leading European Institutions: done.

- Recruitment of incoming experienced researchers: done (the researchers hired have been engaged in the preparation of research proposals, in networking throughout Europe, and in research activities established).

- Equipment purchase: done. Exploitation is underway.
Organization of the 6 workshops, two International Conference and Participation in International Conferences: done

Organization of other dissemination activities (Website development, Participation in Posidonia International Exhibition, Organization of the two Open Days): done

Please include a summary of the recommendations from the previous reviews (if any) and indicate how these have been taken into account.

No recommendations have been made by E.C.. On the other hand, the recommendations made by the Advisory-Steering Committee on the planned annual meetings have been taken into consideration to the maximum possible extent (see deliverables D1.1, D1.2 and D1.5).

Work progress and achievements during the period
Please provide a concise overview of the progress of the work in line with the structure of Annex I to the Grant Agreement.

For each work package, except project management, which will be reported in the management section, please provide the following information:

In the following, the analysis of the project activities per work-package is presented.

WP2: Two-Way Exchanges

• A summary of progress towards objectives and details for each task;

The two-way exchanges (WP2) have been accomplished as originally planned in the first period. More specifically:

Two-Way exchanges with

– Converteam UK Ltd
– ETH-Zurich
SUMMARY OF VISIT EXCHANGES

<table>
<thead>
<tr>
<th></th>
<th>No of outgoing visiting researchers*</th>
<th>No of incoming visiting researchers*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[from NTUA]</td>
<td>[to NTUA]</td>
</tr>
<tr>
<td></td>
<td>Planned</td>
<td>Done</td>
</tr>
<tr>
<td>2.1 Converteam</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2.2 DCNS</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>2.3 ValMarine/L-3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2.4 Wärtsilä</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2.5 UCL</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2.6 ETH</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>2.7 IFPen</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>2.8 EXA</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>23</td>
<td>25</td>
</tr>
</tbody>
</table>

*In certain cases, more than one visits were made by the same researcher.

However, in all cases, each visit of a researcher is considered to increase the total number of visiting researchers by one.
Visits from Collaborating Institutions to NTUA

<table>
<thead>
<tr>
<th>Collaborating Institution</th>
<th>Dates of Visit</th>
<th>Researchers</th>
<th>No of Visit Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFPEN</td>
<td>7-10 November 2011 (4 days)</td>
<td>2 researchers: Dr. J. Bohbot, Dr. A. Abdehli</td>
<td>8+6=14</td>
</tr>
<tr>
<td></td>
<td>3-5 June 2012 (3 days)</td>
<td>2 researchers: Dr. J. Bohbot, Dr. A. Abdehli</td>
<td></td>
</tr>
<tr>
<td>UCL</td>
<td>10-16 January 2012 (7 days)</td>
<td>2 researchers: Senior Lecturers Dr. A. Greig and Dr. R. Bucknall</td>
<td>14+7+10=31</td>
</tr>
<tr>
<td></td>
<td>31 May-6 June 2012 (7 days)</td>
<td>1 researcher: Senior Lecturer Dr. A. Greig</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21-25 Nov 2012 (5 days)</td>
<td>2 researchers: Senior Lecturer Dr. A. Greig and Professor R. Bucknall</td>
<td></td>
</tr>
<tr>
<td>Converteam</td>
<td>10-15 January 2012 (6 days)</td>
<td>1 researcher: Dr. M. Benatmane (ex-executive of CONVERTEAM)</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>22-27 November 2012 (6 days)</td>
<td>1 researcher: Dr. M. Benatmane (ex-executive of CONVERTEAM)</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>Dates</td>
<td>Researchers</td>
<td>Days</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------</td>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td>EXA</td>
<td>15-17 July 2012 (3 days)</td>
<td>1 researcher: Mr. S. Jelic</td>
<td>3</td>
</tr>
<tr>
<td>ETH-Zurich</td>
<td>10-13 January 2012 (4 days)</td>
<td>1 researcher: Dr. C. Onder</td>
<td>4+3+4+4=15</td>
</tr>
<tr>
<td></td>
<td>13-15 January 2012 (3 days)</td>
<td>1 researcher: Professor K. Boulouchos</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6-9 Nov 2012 (4 days)</td>
<td>1 researcher: Dr. Y. Wright</td>
<td></td>
</tr>
<tr>
<td></td>
<td>22-25 Nov 2012 (4 days)</td>
<td>1 researcher: Professor K. Boulouchos</td>
<td></td>
</tr>
<tr>
<td>Wärtsilä Switzerland</td>
<td>13-14 January 2012 (2 days)</td>
<td>1 researcher: Dr. G. Weisser</td>
<td>2+14=16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 researchers: Dr. G. Weisser, Dr. K. Herrmann</td>
<td></td>
</tr>
<tr>
<td>DCNS (planned)</td>
<td>3-5 December 2012 (3 days)</td>
<td>Mr. D. Fouilly</td>
<td>3</td>
</tr>
<tr>
<td>VALMARINE</td>
<td>20-21 October 2012 (2 days)</td>
<td>Mr. O. Knutson</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>96</strong></td>
</tr>
</tbody>
</table>
### Visits from NTUA to Collaborating Institutions

<table>
<thead>
<tr>
<th>Collaborating Institution</th>
<th>Dates of Visit</th>
<th>Researchers</th>
<th>No of Visit Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCL</td>
<td>9-19 May 2011 (11 days)</td>
<td>3 researchers: Assistant Professors John Prousalidis and Nikos Ventikos, Adjunct Lecturer Stylianos Perissakis</td>
<td>33</td>
</tr>
<tr>
<td>ETH-Zurich</td>
<td>20 June 2011 -2 July 2011 (13 days)</td>
<td>2 researchers: Ass. Professor Lambros Kaiktsis, Lecturer Christos Papadopoulos</td>
<td>26+12+11=49</td>
</tr>
<tr>
<td></td>
<td>25 June 2012-6 July 2012 (6 days) [joint visit with Wärtsilä-Switzerland]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-13 July 2012 (11 days)</td>
<td>1 researcher : Dr. D. Grekas</td>
<td></td>
</tr>
<tr>
<td>Converteam</td>
<td>28 September – 6 October 2011 (9 days)</td>
<td>5 researchers: Ass. Professor John Prousalidis, Dr. G. Antonopoulos, Dr. Y. Tsourakis, Dr. F. Kanellos</td>
<td>45</td>
</tr>
<tr>
<td>Location</td>
<td>Dates</td>
<td>Details</td>
<td>Researchers</td>
</tr>
<tr>
<td>----------</td>
<td>-------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>IFPen</td>
<td>16-20 June 2012 (5-days) [joint visit with DCNS]</td>
<td></td>
<td>Dr. Ch. Patsios</td>
</tr>
<tr>
<td></td>
<td>23-28 September (6-days)</td>
<td></td>
<td>1 researcher: Ass. Professor John Prousalidis</td>
</tr>
<tr>
<td></td>
<td>21-26 October (6 days)</td>
<td></td>
<td>1 researcher: Lecturer Christos Papadopoulos</td>
</tr>
<tr>
<td>DCNS</td>
<td>21-24 June 2012 (4-days) [joint visit with IFPen]</td>
<td></td>
<td>1 researcher: Ass. Professor John Prousalidis</td>
</tr>
<tr>
<td></td>
<td>3-13 September (11 days)</td>
<td></td>
<td>1 researcher: Ass. Professor John Prousalidis</td>
</tr>
</tbody>
</table>
It is noted that, at the project beginning it had been anticipated that each outgoing visit from NTUA to a Collaborating Institution would have a mean duration of about 15 days, while an incoming visit to NTUA would have a mean duration of about 7 days. However, reaching these numbers was in many cases not possible for a number of reasons:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Date Details</th>
<th>Researchers</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wärtsilä-Switzerland</td>
<td>25 June 2012-6 July 2012 [6 days joint visit with ETH-Zurich days]</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>VALMARINE/L-3</td>
<td>30 September – 4 October (5 days)</td>
<td>1 researcher: Dr. C. Patsios</td>
<td>5</td>
</tr>
<tr>
<td>(after L-3 proposition the visit took place in L-3 premises in Bristol/UK)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXA (planned)</td>
<td>2-7 December (6-days)</td>
<td>2 researchers: Dr. K. Aivalis, Dr. D. Grekas,</td>
<td>12+3=15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-7 December (3-days)</td>
<td>1 researcher: Dr. S. Dallas</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>203</strong></td>
</tr>
</tbody>
</table>
- Difficulties in finding common time slots of long duration between researchers of NTUA and Collaborating Institutions, especially the industrial ones.
- Difficulties in co-ordinating the joint absence of several S-NAME/NTUA faculty members.

However, taking into account the decreased duration of visits in conjunction with the increased number of senior researchers approved by the Project Officer (from 3 to 6, see also WP3) and the identification of major common areas of interest between NTUA and the Collaborating Institutions, more researchers have participated in the two-way secondments. In all cases, the in-situ presence enabled in-depth discussions, focusing on mapping common or complementary areas of research, getting to know the facilities and achievements of each member of the network, writing joint papers and outlining and preparing joint project proposals.

Moreover, an extension of this activity was approved by the officer originally in June 2013 (via e-mail) and in November 2013 (via the amended contract). Thus, visits from NTUA to collaborating EU Institutions took place (comprising those associated partners mostly interested in further cultivating MARINELIVE activities). To maximize the project outcome, in some of these occasions, a small number of visits to other Institutions located nearby associated Institutions, also took place. In certain cases, these joint visits took place on the occasion of participation in conferences and workshops.

**Visit to France by Professor J. Prousalidis**
A joint visit took place in Paris (France) in August 2013 combining contacts with IFPen, DCNS (associated MARINELIVE partners) as well as NG3 and BV. The main goal of the visit was to identify synergies for the forthcoming H2020 project calls. In the case of IFPen, a long-prospect co-operation in ship energy system modeling has been planned. A common platform based on the AMESIM software of LMS will be developed via a joint research effort. A PhD thesis has already been launched at NTUA to this end.

**Visit to France by Professor C. Papadopoulos**

On the occasion of a workshop organized by the University of Poitiers, a short visit to the premises of the University and the CNRS Research Director, Professor M. Fillon, took place, and has included useful discussions on the H2020 project calls.
Visit to UK by Professor J. Prousalidis

On the occasion of a workshop organized in Bristol (UK) by IMarEST, a joint visit to the premises of the University of Southampton and the premises of Lloyd’s Register at Southampton took place in July 2013. Useful discussions on future collaboration possibilities, also including the H2020 frame, took place.

Visit to Switzerland by Professor L. Kaiktsis

Professor Kaiktsis was invited to make a joint visit to both ETH-Zurich and Wärtsilä Switzerland (both being official associated MARINELIVE partners).

In all cases, close co-operation on ongoing research took place. Further, discussions on the H2020 project calls addressing clean maritime transport were made, and new proposals were designed.

• Highlight clearly significant results;

An extensive network of stakeholders in the area of All Electric Ship has been established in Europe and overseas (e.g. in USA – Electric Ship Consortium). A representative example of strengthening ties with an EU country is UK (common activities with UCL, University of Southampton, Lloyd’s Register, IMarEST).

Further, partially due to the added value of MARINELIVE, the NTUA research team has succeeded the approval of three research projects co-funded by European Structural funds and Hellenic National resources, namely:

- “DEFKALION” (“THALIS” call of the Hellenic Ministry of Education): “Investigation of Electric Power Quality problems occurred in ship electric energy networks” networking researchers from all over Greece (project Coordinator: Ass. Professor John Prousalidis)
- “DC-Ship” (“ARISTEIA” call of the General Research Secretariat): “Integration of DC in ships Initiative” exploiting the MARINELIVE research capacity to
marine electrical engineering issues (project Coordinator: Ass. Professor John Prousalidis)


In addition, four EU proposals have been submitted, three of which headed by members of the MARINELIVE team (Professors J. Prousalidis and L. Kaiktsis).

- “Retro-Ship”, submitted in December 2010 (within the framework of “Transport 2010”)
- “GOLD IRONING” submitted in January 2012 (within the framework of “Regions of Knowledge 2012”)
- “ECO-MARINE” submitted in January 2012 (within the framework of “Marie-Curie 2012”) (re-submitted as “ECCO-MATE” in November 2012, decision pending)
- “e-ZERO Ship” submitted in November 2012 (within the framework of “Transport 2012”), on reserve list after evaluation

It is noted that the “e-ZERO Ship” project proposed has aimed at a substantial reduction of ship’s energy consumption, by at least 20%, and thus greenhouse gas and pollutant emissions, utilizing the All Electric Ship (AES) design concept via a holistic approach. This has been a major effort, coordinated by Prof. Prousalidis and the MARINELIVE team, involving a total of 23 European industrial and academic partners.

• If applicable, explain the reasons for deviations from Annex I and their impact on other tasks as well as on available resources and planning;

Only the following minor remark is made:

As hinted above, the only deviation is related to the exchange of visits (long travels) with Collaborating Institutions. It is underlined here that the reduced amount is the outcome of several factors affecting the travel activities:
- During the project, some travels had a smaller cost than that originally planned, for a number of reasons (better prices achieved for airfare and hotels, shorter duration, etc).

- The official policy of the National Technical University of Athens on daily allowances has been adapted, following a more general adaptation in the public sector of the Greek State, due to the financial crisis; thus, the per-diem rate is not eligible for most of the MARINELIVE researchers (either of NTUA and of the collaborating Institutions).

**If applicable, explain the reasons for failing to achieve critical objectives and/or not being on schedule and explain the impact on other tasks as well as on available resources and planning (the explanations should be coherent with the declaration by the project coordinator);**

Not applicable

**a statement on the use of resources, in particular highlighting and explaining deviations between actual and planned person-months per work package and per beneficiary in Annex 1 (Description of Work);**

Already done in Form C

**If applicable, propose corrective actions**

Not applicable

**WP3: Recruitment of incoming experienced researchers**

1. Recruitment of researcher on Electric Grid Configurations and Protection & PMS/EPMACS
Dr. Georgios Antonopoulos

2. Recruitment of researcher on Control Systems of Electric Machines & Power Electronics

Dr. Georgios Tsourakis

3. Recruitment of researcher on Applications of Computational Fluid Dynamics & Optimization on Marine Diesel Engines

Dr. Dionysis Grekas

Three more researchers, approved by the EU Project Officer in December 2011.

4. Recruitment of researcher dealing with activities on the new Dual Fuel marine engines/prime movers (natural gas engines capable to also operate in Light Fuel Oil (LFO) or Heavy Fuel Oil (HFO) burning modes). This activity is accompanied by an intensified activity on fuel modeling, especially Heavy Fuel Oil modeling.

Dr. Eirini Efstathiou

5. Recruitment of researcher dealing with activities on hybrid ship energy and propulsion systems, and their optimization by means of advanced algorithms, applied via sophisticated power electronic converters.

Dr. Charalampos Patsios

6. Recruitment of researcher dealing with activities emerged throughout the Globe, especially in the US, towards combining the developments in Electric Ship Technology with the developments in Smart Grid Technology (including renewables).

Initially Dr. Ioannis Kobougias was recruited, but when he left Greece, Dr. Stefanos Dallas was recruited.
• A summary of progress towards objectives and details for each task;

The presence of new researchers has given the activities of MARINELIVE a strong boost, in important areas within the general framework of All Electric Ship. Further, this has enabled the absorption of the budget allocated for researcher recruitment, as due to the economical crisis the monthly rates and salaries have been considerably reduced.

• Highlight clearly significant results;

The researchers have been heavily involved in all related research sectors with significant results as proven by the journal and conference papers produced, as well as the proposals that have been approved, partially thanks to the involvement of the researchers recruited.

• If applicable, explain the reasons for deviations from Annex I and their impact on other tasks as well as on available resources and planning;

Three more researchers, approved by the EU Project Officer in December 2011.

The presence of new researchers has given the activities of MARINELIVE a strong boost, in important areas within the general framework of All Electric Ship. Further, this has enabled the absorption of the budget allocated for researcher recruitment, as due to the economical crisis the monthly rates and salaries have been considerably reduced.

• If applicable, explain the reasons for failing to achieve critical objectives and/or not being on schedule and explain the impact on other tasks as well as on available resources and planning (the explanations should be coherent with the declaration by the project coordinator) ;

Not applicable

• a statement on the use of resources, in particular highlighting and explaining deviations between actual and planned person-months per work package and per beneficiary in Annex 1 (Description of Work);

All explanations are provided in Form C.
If applicable, propose corrective actions.

Not applicable

WP4: Acquisition, upgrading and installation of equipment

A summary of progress towards objectives and details for each task;

The Equipment procurement (WP4) was accomplished as originally planned in the first period. Thus,

1. Acquisition and Installation of a Grid Emulator and PMS/EPMACS (including a fuel cell unit for electricity production and a power quality event generator)
2. Upgrade of a Parallel Computational Cluster

Furthermore, associated software to enable research related to MARINELIVE objectives has also been purchased, namely PSCAD, MOTORCAD, FLUX3D.

The equipment acquired is to be extensively exploited in the recently initiated research projects DEFKALION-THALIS, DC-Ship, TRIBO-MARINE.

Moreover, an extension of this activity was approved by the officer originally in June 2013 (via e-mail) and in November 2013 (via the amended contract) and additional components were purchased (see below).

Highlight clearly significant results;

Equipment purchased in first period (according to the original contract)

- Ship Electric Grid Emulator (power generation, distribution and protection sub-systems)
- EPMACS/PMS (Power Management System)
- Fuel Cell Unit (renewable energy source of the grid emulator)
- Power Quality Event Generator
- Associated software for electric grid component design (FLUX3D, MOTORCAD, PSCAD)
- Computer cluster upgrade (including cooling system)

The cost of this main set was about 590,000.00 Euros. A more detailed report on the acquisition of this main set of MARINELIVE equipment can be found in Deliverable No 4.1.

Equipment purchased in the second period (according to the amended contract)

- Tribometer extension (profilometer)
- Rapid prototyping system
- Data storage support system of computer cluster
- Combustion experimental facility
- Ship - shore interconnection for ship grid emulator
- Installation of safe hydrogen distribution and protection scheme against leakage of the fuel cell purchased
- Software for optimized machine and grid design via central server license (FLUX+GOT-IT+AMESIM)

The justification of the procurement of this equipment is included in the amended contract. The cost of this second complementary set was about 70,000.00 Euros.

• If applicable, explain the reasons for deviations from Annex I and their impact on other tasks as well as on available resources and planning;

Due to some bureaucratic difficulties, some minor pieces of this second set were not purchased in the end, namely KIVA, ANSYS and SPEED software as well as a high-speed camera. Therefore, in co-operation with the European Officer a small amount of money was transferred from the additional equipment procurement (corresponding to WP4) to some extra dissemination activities (corresponding to WP6). The corresponding e-mail exchange is cited in the Appendix A.
• If applicable, explain the reasons for failing to achieve critical objectives and/or not being on schedule and explain the impact on other tasks as well as on available resources and planning (the explanations should be coherent with the declaration by the project coordinator);

Not applicable

• A statement on the use of resources, in particular highlighting and explaining deviations between actual and planned person-months per work package and per beneficiary in Annex 1 (Description of Work);

Already done in Form C

• If applicable, propose corrective actions

Not applicable

WP5: Organisation of workshops and conferences

• A summary of progress towards objectives and details for each task;

In the following, the dates per event are enlisted:

1. Workshop on Propulsion Systems *(11-12 Jan 2012)*
2. Workshop on Electric Machines and Power Converters *(12-13 Jan 2012)*
3. Workshop on Prime Movers *(21-22 Nov 2012)*
4. Workshop on Ship Automation and Control *(22-23 Nov 2012)*
5. Workshop on Ship Electric Grids *(3-4 Jun 2013)*
7. First Conference on AES *(4-5 Jun 2012)*
8. Second Conference on AES *(12-13 Feb 2014)*

In addition, members of the MARINELIVE team participated in a significant number of technical meetings and published papers in peer reviewed journals.
Furthermore, a pilot-scale web-conference (at zero cost) was organized on November 21\textsuperscript{st}, 2013. This effort was not planned in the contract (neither the original nor the amended one), it had no additional cost, while it was a test for the next future steps of the MARINELIVE technical meetings.

A more detailed report on the organization of the conferences and workshops can be found in \textit{Deliverables No D5.1, D5.2, D5.3, D5.5}.

\textbf{Highlight clearly significant results;}

Finally, according to the contract, in WP5, there was another activity namely:

\textbf{9. Participation of NAME-NTUA personnel in international conferences}

In continuance of the participation in 14 International conferences during the first period, members of the MARINELIVE team participated in 12 International conferences/workshops during the second period. In particular, (the name of the author who gave the presentation is underlined):

\textbf{2011}


2012


2013


2014
Thus, besides the MARINELIVE meetings (2 conferences and 6 workshops), members of MARINELIVE team participated, in total, in 26 international meetings presenting the work produced during the MARINELIVE project. A more detailed description of the participation in the conferences can be found in Deliverables D5.4 and D5.6.

- If applicable, explain the reasons for deviations from Annex I and their impact on other tasks as well as on available resources and planning;

Not applicable.

- If applicable, explain the reasons for failing to achieve critical objectives and/or not being on schedule and explain the impact on other tasks as well as on available resources and planning (the explanations should be coherent with the declaration by the project coordinator);

Not applicable.

- A statement on the use of resources, in particular highlighting and explaining deviations between actual and planned person-months per work package and per beneficiary in Annex 1 (Description of Work);

Already done in Form C.

- If applicable, propose corrective actions

Not applicable.

WP6: Dissemination and promotional activities

- A summary of progress towards objectives and details for each task;
During the third and final stage of the project, the dissemination activities planned were completed.

**Highlight clearly significant results;**

The following dissemination activities took place (for more details, see Deliverables No D6.1, D5.6 and D6.2):

1. **Update of Project Website**  
   (www.marinelive.org).

2a. **Publications in peer-reviewed journals and international conferences.**

*Publications in peer-reviewed journals in the second period*

In addition to the publications in international conferences mentioned in WP5 activities, 6 papers were published in peer reviewed journals (3 of them in the first period and 3 of them in the second period). The full list follows:


Publications in peer-reviewed journals in the second period


2b. Organization of Open Days

2b. Organization of 1st Open-Day Event (7 Jun 2012)
Organization of the 2nd Open-Day Event (14 Feb 2014)

3. Additional notes on MARINELIVE dissemination and promotion activities:

- An unofficial Press release to Greek Press was held in April 2011
- The 1st Official Press release to International Press on the occasion of the International Press Conference within the Posidonia International Exhibition (Wednesday, June 6 June 2012). According to the official report, there were 38 media references (printed and electronic press, 138.359 € media value, i.e., were these articles not complimentary, NTUA should have paid this amount of money for publishing these texts; this estimated value is based on space allocated and the price rates for each medium).
- The second International Press Release accompanied by a Press Conference was given in parallel to the 2nd International Conference on All Electric Ship Technology in the Metropolitan Hotel. This time 24 media references in printed and electronic media were noted (referring to a media value of 95,693.00 €

\(^2\) The corresponding values of the First official Press release in June 2012 was 38 media references and a media value of 138,359.00 €, respectively.

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• According to a last minute change (approved by the European Officer via e-mail), a final set of dissemination activities took place in June 2014, on the occasion of the Posidonia Exhibition 2014, namely:
  o A Press Release was distributed upon the closure of the project, in June 2014. The circulation of this release coincided with the Posidonia Exhibition 2014.
  o A brochure promoting the MARINELIVE team was prepared and distributed on the occasion of the Posidonia Exhibition 2014.
  o The MARINELIVE team managed to attend the Marimatch B2B networking event. The event was held within the Posidonia Exhibition 2014 and was organized by the local NCP. During this networking, bilateral meetings were organized where the brochures of the MARINELIVE team/work were distributed.

• If applicable, explain the reasons for deviations from Annex I and their impact on other tasks as well as on available resources and planning;

As already mentioned in WP4, in co-operation with the European Officer a small amount of money was transferred from the additional equipment procurement (corresponding to WP4) to some extra dissemination activities (corresponding to WP6). The corresponding e-mail exchange is cited in the Appendix A.

• If applicable, explain the reasons for failing to achieve critical objectives and/or not being on schedule and explain the impact on other tasks as well as on available resources and planning (the explanations should be coherent with the declaration by the project coordinator);

Not applicable

• a statement on the use of resources, in particular highlighting and explaining deviations between actual and planned person-months per work package and per beneficiary in Annex 1 (Description of Work);

Already done in Form C
• If applicable, propose corrective actions
Not applicable

Project management during the period (WP1)

Please use this section to summarise management of the consortium activities during the period. Management tasks are indicated in Articles II.2.3 and Article II.16.5 of the Grant Agreement.

Amongst others, this section should include the following:

• Consortium management tasks and achievements;

As already indicated, the project is a single partner one. NTUA is the only partner – beneficiary which coordinates the project. There is an Advisory-Steering Committee comprising international experts, which monitors the progress and results of the project. The comments and recommendations of the Advisory-Steering Committee for the last period are listed in Deliverables D1.1, D1.2, D1.5.
• **Problems which have occurred and how they were solved or envisaged solutions;**

Significant difficulties occurred when striking mobilizations ceased the operation of NTUA for a long period just few months before the end of the project. In co-operation with the E.C. a 6-month extension was requested and approved. An amended contract was submitted and approved. On this occasion, several shifts in the budget and technical amendments were included, too. Despite the unforeseen difficulties the project had a good progress to its end.

• **Changes in the consortium, if any;**

No changes (the project involves only one partner, with the presence of collaborating Institutions).

• **List of project meetings, dates and venues;**

Besides the kick-off meeting, the major meetings refer to the meetings of the Advisory-Steering Committee. Thus, the project meetings have been:

- Kick – off meeting (January 14\textsuperscript{th}, 2011, Venue: NTUA)
- 1\textsuperscript{st} Meeting of the Advisory-Steering Committee (January 13-14\textsuperscript{th}, 2012, Venue: National Hellenic Research Foundation (NHRF))
- 2\textsuperscript{nd} Meeting of Advisory-Steering Committee (November 23-24\textsuperscript{th}, 2012, Venue: National Technical University of Athens (NTUA))
- 3\textsuperscript{rd} Meeting of Advisory-Steering Committee (February 14\textsuperscript{th}, 2014, Venue: National Technical University of Athens (NTUA))

• **Project planning and status;**

The project was concluded keeping to a satisfactory extent the planned deadlines and milestones. Due to the good and timely co-operation between the project manager and the E.C. all problems encountered were faced and resolved.
• Impact of possible deviations from the planned milestones and deliverables, if any;

Not applicable

• Any changes to the legal status of any of the beneficiaries, in particular non-profit public bodies secondary and higher education establishments, research organisations and SMEs;

Not applicable

• Development of the Project website, if applicable;

The official website of the project is:

www.marinelive.org

The development of the website is presented in detail in Deliverable D6.1. Some important points concerning the website are:

• The main information regarding the MARINELIVE work-packages, activities, people, dissemination events and achievements is presented.
• A repository with information about past MARINELIVE related events is included.
• Links about events related to the scope and activities of MARINELIVE are included.

The section should also provide short comments and information on co-ordination activities during the period in question, such as communication between beneficiaries, possible co-operation with other projects/programmes etc.

On the occasion of the MARINELIVE activities and events, close communication has been developed with members of the research teams of other projects:

• “LRF - Centre of Excellence in Ship Total Energy-Emissions-Economy” (coordinated by NTUA, funded by Lloyd’s Register Foundation, formerly named as Lloyd’s Register Educational Trust -LRET)
• Low-Carbon Shipping (coordinated by UCL, funded by the UK Government)
• POSEIDON (coordinated by BMT-Defence, funded by E.C.)
For Grant Agreements related to infrastructures (Annex III to the Grant Agreement), the access provider shall include a section in the periodic reports on the access activity, indicating the membership of the selection panel as well as the amount of access provided to the user groups, with the description of their work, and the names and home institutions of users.

Attached document: Include one PDF document following the annotated structure above.

**Deliverables** The deliverables due in this reporting period, as indicated in Annex I to the Grant Agreement have to be uploaded by the responsible participants (as indicated in Annex I), and then approved and submitted by the Coordinator. Deliverables are of a nature other than periodic or final reports (ex: "prototypes", "demonstrators" or "others"). If the deliverables are not well explained in the periodic and/or final reports, then, a short descriptive report should be submitted, so that the Commission has a record of their existence.

If a deliverable has been cancelled or regrouped with another one, please indicate this in the column "Comments". If a new deliverable is proposed, please indicate this in the column "Comments".

This table is cumulative, that is, it should always show all deliverables from the beginning of the project.
Appendix A

Communication with the European Officer
John Prousalidis <jprousal@naval.ntua.gr>

27 Μαΐου

προς WARIN, Lambros

Dear MS Warin

thank you so much for this.

Looking forward to meeting you in two weeks

John

2014-05-27 16:38 GMT+03:00 EC ARES NOREPLY <DIGIT-NOREPLYARES@ec.europa.eu>:

Sent by WARIN Colombe (RTD) <Colombe.WARIN@ec.europa.eu>. All responses have to be sent to this email address.

Envoyé par WARIN Colombe (RTD) <Colombe.WARIN@ec.europa.eu> . Toutes les réponses doivent être effectuées à cette adresse électronique.

Dear John,

Approved provided the details you gave me. Please add this in the report.
Dear WARIN Colombe (RTD),

Thank you for your affirmative feedback. Regarding your question, I would say that each activity described has an estimated cost varying between 3000 and 4000 Euros. As a matter of fact, we have to comply with this order of values of cost, so that any agreement procedures do not take too long.

Best regards,

John and Lambros
Dear John,

This looks fine but please give me a financial estimation for each of those activities listed below.

Thanks,

Colombe

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From: jprousal@gmail.com [mailto:jprousal@gmail.com] On Behalf Of John Prousalidis

Sent: Tuesday, May 20, 2014 2:48 PM

To: WARIN Colombe (RTD)

Cc: Lambros Kaiktsis

Subject: Re: MARINELIVE

Dear Ms Warin,

thank you very much for your e-mail message.

As mentioned in my previous e-mail, the major immediate upcoming challenge is the Posidonia International maritime exhibition, which will be held in Athens in the interval 2-6 June 2014 (just one week before the formal end of MARINELIVE). During this exhibition, which attracts the
interest of the maritime community worldwide, we will have our last chance to offer a conclusive report to the maritime stakeholders about the results of MARINELIVE, as well as the next steps, exploiting the potential generated during the project. I would like to point out that a networking event is planned within the Posidonia exhibition (MariMatch 2014 - B2B Networking Event, http://www.b2match.eu/marimatch2014). The event is organized by our National Contact Point. We consider this an excellent opportunity to initiate new partnerships for the next steps following the formal termination of the MARINELIVE project.

Although the time left until June 2 is fairly short, we plan to have at least one of the following promotional actions (time is, of course, the biggest obstacle at the moment):

- Prepare and distribute a press release presenting the final outcome of MARINELIVE, including references to follow-up activities.

- Prepare CD/DVDs and/or USB sticks with the main activities of MARINELIVE, including a summary of the research performed by the MARINELIVE team and the papers presented in the MARINELIVE workshops and conferences. Time permitting, some representative posters may also be prepared.

Thank you again for all your support. Please inform me regarding any other questions that you may have.

Best regards

John
I would like to know what this amount of 8,500 Euros will be used to: i.e. what kind of actions? You mention “promote the results” of MARINELIVE.

Could you specify?

Thanks,

Colombe

Colombe WARIN
Policy Officer

European Commission
DG Research & Innovation
B5- Spreading excellence and Widening participation

ORBN 09/009
1049 Brussels/Belgium
+32 229-55466
colombe.warin@ec.europa.eu
Dear Ms Warin,

our best regards from Athens.

Following our conversation over the phone, I would like to inform you that as we are making the effort to close all hanging issues in MARINELIVE we encounter some difficulties regarding the procurement of some pieces of equipment as their providers are not willing to comply with the rules of our University. Thus, about 8500
Euros can not be spent and as we are running out of time I wish that this amount of money is transferred to the "other expenses".

This change does not have any significant impact on the equipment procurement, while via this solution we will be able, for instance, to promote somehow better the MARINELIVE results e.g on the occasion of the Posidonia Exhibition 2014 (held in the interval 2-6 June 2014) etc.

Looking forward to your affirmative and timely feedback

Best regards

John

John Prousalidis <jprousal@naval.ntua.gr>

7 Μαΐ
Dear John,

Thanks for your email and the details you gave me, I can accept this budget shift of 16,500 Euros from Personnel costs and 4,000 Euros from Other costs in order to cover 20,000 Euros for travel costs.

Sent by WARIN Colombe (RTD) <Colombe.WARIN@ec.europa.eu>. All responses have to be sent to this email address.

Envoyé par WARIN Colombe (RTD) <Colombe.WARIN@ec.europa.eu> . Toutes les réponses doivent être effectuées à cette adresse électronique.

προς Despina

------------- Forwarded message -----------

From: EC ARES NOREPLY <DIGIT-NOREPLYARES@ec.europa.eu>
Date: 2014-03-17 18:23 GMT+02:00
Subject: Ares(2014)766135 - RE: Request for minor amendment regarding travel expenses in the MARINELIVE project
To: "jprousal@naval.ntua.gr" <jprousal@naval.ntua.gr>
Cc: "kaiktsis@naval.ntua.gr" <kaiktsis@naval.ntua.gr>

Thanks for your email and the details you gave me, I can accept this budget shift of 16.500 Euros from Personnel costs and 4.000 Euros from Other costs in order to cover 20.000 Euros for travel costs.
No amendment is needed for this, this email is sufficient.

Please do mention this in the final report.

Best regards,

Colombe

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From: jprusal@gmail.com [mailto:jprusal@gmail.com] On Behalf Of John Prousalidis

Sent: Friday, March 07, 2014 10:20 AM

To: WARIN Colombe (RTD)

Cc: Lambros Kaiktsis

Subject: Request for minor amendment regarding travel expenses in the MARINELIVE project

Dear Ms Warin

my best regards from Athens

Following our conversation over the phone, I would like to ask your help for the following issue.

Now that MARINELIVE comes close to its end, the set of travels is being concluded. It seems that during the transient period of operation at our University, it was hard to keep a good balance of the travel expenses done, and hence, during the amendment (in October/November 2013), the shortcut discussed was not well estimated. Hence, now there is a difference of about 20,000 Euros in travel expenses that cannot be covered by the budget approved on November 1st 2013.
We have worked out the following solution which also helps the normal execution of the entire budget, as well (the total project budget remains the same):

a) An amount from the personnel cost dedicated to Academic staff (personnel cost) is transferred for the benefit of travel expenses. This shift refers to 16,500.00 Euros or 3 mean person-months according to the contract.

b) A small amount of 4,000 Euros of “other costs” (not initially dedicated exclusively for travels) is shifted internally for travels. Please note that although in the contract and the other official documents with the E.C. the travels are included in the category "other costs" in the project records of the NTUA Administration there is a distinction between travels and "other miscellaneous costs" which are to cover small expenses not originally predicted.

I will be happy to provide to you any further explanations.

Best regards

John

2013-11-04 13:15 GMT+02:00 <Colombe.WARIN@ec.europa.eu>:

Dear John,
Following your email, I can approve both requests, the one about the subcontracting (providing the details in a table as requested by Nicola Negrelli, our Financial Officer) and the rate of 34.29% of equipment as you justified this acquisition for the smooth development of the project.

Moreover, your request of extension of the project due to the critical situation in your university (case of “force majeure”) is acceptable in this exceptional case.

I have validated those changes in NEF and Nicola will now explain you how to finalise this amendment process.

Best regards,

Colombe

Colombe WARIN
Policy Officer

European Commission
DG Research & Innovation
C5- regional Dimension of Innovation

ORBN 09/009
1049 Brussels/Belgium
Dear Ms Warin,

following the telephonic conversation we had some time ago regarding the response of Mr Negrelli, I am passing to you attached the tables to be inserted in the amended Part B (the formatting of the tables might change a little but the important figures of the costs). As you can see:

a) the total cost of subcontracting activities sums up to € 182,463.72

b) the total equipment cost (including the new items grouped as "second sub-set" which we have discussed last June) is

665,121.34 (i.e. 665,121.34/1,939,741.00=34.29% of the total budget, if I am not wrong)
I will be happy to answer any of your queries

best regards

John

2013/10/25 <Nicola.NEGRELLI@ec.europa.eu>

Dear John,

Thank you for submitting in NEF and for the Word file with track changes that you sent us.

Ms Warin is out of office this week and therefore we will have her feedback next week. In spite of this, as I already have few requests for you, I am going to give you my feedback and I will re-open the session in NEF so that you can already start to work on it.

EQUIPMENT:

The REGPOT Work Programme foresees that the costs for the Equipment should not amount to more than 30% of the total budget costs, safe in duly justified cases where the equipment is capital to increase the applicant's research capacity.

On the other hand, the amount foreseen now, 665.140 €, is higher than the 30 % of the total budget (which now is 645.900 €).

I would suggest that you decrease the budget for equipment so that it is lower than the 30 % of the total budget, but in case you think there are the conditions for asking exceptionally to spend more than that, I would ask you to send us a justification for that and, if the justification is accepted by the Project Officer, you can leave the present budget.

In addition to this, I would kindly ask you to add in this paragraph a table with all the pieces of equipment that have been or should be bought and their prices, whose sum should give the total budget foreseen.
SUBCONTRACTING:

I would kindly ask you to add a table listing each activity that is going to be subcontracted and the budget foreseen for each of them. Please also complete the sentence, as the sum of 6.000 € and 91.626 € doesn't give the total amount foreseen for subcontracting (€ 182.463,72).

Finally, in relation to the table at pag 46 of Part B, please correct the amounts in the column "Over-head 20%" and in the column "Total costs"; they should be consistent with the amounts in table WT8. Alternatively, you can delete these two columns.

Thank you for your cooperation,

Best regards,

Nicola

From: jprousal@gmail.com [mailto:jprousal@gmail.com] On Behalf Of John Prousalidis
Sent: Monday, October 21, 2013 4:34 PM
To: NEGRELLI Nicola (RTD); WARIN Colombe (RTD)
Cc: Lambros Kaiktsis; MARTINEZ Y FOIX Vanessa (RTD)
Subject: Re: Ares(2013)3206975 - RE: MARINELIVE amendment
we have just submitted the amended version of the MARINELIVE project (No 264057). This time the amended Part B has been uploaded. For your convenience, the MS-word file (.doc) with the tracked changes is attached to this e-mail.

We will be happy to answer any of your queries.

Thank you very much for your help

Best regards

John Prousalidis, Lambros Kaiktsis

2013/10/17 <Nicola.NEGRELLI@ec.europa.eu>

Dear John,

I have just started checking the info you introduced in NEF and the new Part B, but I realised that in place of the standard Part B you uploaded the request for amendment. Actually this is not what we meant with our former messages, and therefore I am obliged to open again the session in NEF and ask you to change Part B:

You should start from the Part B that was uploaded in NEF when the NEG0 was closed and the Grant Agreement signed and modify it with track changes. The information provided there, particularly the tables about the resources to be committed, the subcontracting, the equipment etc... should be consistent with the new numbers you introduced in NEF, and the changes you do should only the necessary ones that you agreed with Colombe.

We have first of all to agree on this and only then you should send the official request for amendment following the model that is in the Amendment Guide and without the Addendum because the changes will be in the new Annex I (which will be one of the documents enclosed to the amendment request).
I hope the procedure it is clear now, but in case it is not, please do not hesitate to contact me (until 15.30 I will be in a meeting and tomorrow I won’t be at work).

Thank you for your cooperation,

Best regards,

Nicola NEGRELLI
Legal/Financial Officer

European Commission
DG Research & Innovation
C7

ORBN 06/112
1049 Brussels/Belgium
+32 229-60640
nicola.negrelli@ec.europa.eu

http://ec.europa.eu/research
From: jprousal@gmail.com [mailto:jprousal@gmail.com] On Behalf Of John Prousalidis

Sent: Monday, October 14, 2013 1:45 PM

To: NEGRELLI Nicola (RTD); MARTINEZ Y FOIX Vanessa (RTD); WARIN Colombe (RTD)

Cc: Lambros Kaiktsis

Subject: Re: Ares(2013)3206975 - RE: MARINELIVE amendment

Dear Ms Warin, Dear Mr Negrelli

we have just submitted the amendment for our project MARINELIVE (No 264057) through the session opened in the NEF environment.

The request for an extension of 6 months has also been included and reflected to the deliverables due for the ending date of the project. We are sending you attached the document of the amendment (both in .doc and .pdf format) as well as a .doc version with the track changes facility enabled. Please also note that all changes in critical figures (referring to budget shifts in terms of monetary values and Person-months) are highlighted.

We will be happy to answer to any of your queries.

Thank you for your continuous support to our efforts to overcome the difficulties we encounter.

Best regards

John Prousalidis, Lambros Kaiktsis
2013/10/10 <Nicola.NEGRELLI@ec.europa.eu>

Dear John,

As anticipated by Colombe, I opened a session in NEF so that you can modify Annex I directly from there.

Please do only the minimum changes requiring an amendment and, once you finished, you can upload the new Part B in track changes and submit. In parallel, I would kindly ask you to send us the Word version of Part B with Track Changes by e-mail.

Thank you for your cooperation,

Best regards,

Nicola NEGRELLI
Legal/Financial Officer

European Commission
DG Research & Innovation
C7
Dear John,

Sent by WARIN Colombe (RTD) <Colombe.WARIN@ec.europa.eu>. All responses have to be sent to this email address.

Envoyé par WARIN Colombe (RTD) <Colombe.WARIN@ec.europa.eu>. Toutes les réponses doivent être effectuées à cette adresse électronique.

MARINELIVE – 2nd Periodic Report (Months 1-42)
We checked, with Nicola Negrelli, our Legal Officer, your letter and request for amendment.

Regarding the principle, we agree to launch the amendment for the insertion of the subcontracting costs, the major budget shifts and the 6 months extension.

We need for this to receive the Annex 1 with modification in track changes. Nicola will open a NEF session in order to allow you to insert the revised document.

Please add the changes in budget (only the major budget shifts: ex. the new equipment) and insert the new subcontracting costs.

In case of doubt, do not hesitate to come back to us.

After this is done and accepted by Nicola and myself, you can send us a very short letter (without the addendum) referring to the changes in NEF.

My unit is called DG RTD-C5 and the name of the letter should be my Director, Clara de la Torre.

This letter should be signed on your behalf by the Vice-Rector, Mr. Polyzos. If not possible, you have to appoint a new Legal representative.

Thanks you to let us know if all is clear.

Best regards,
Colombe

Colombe WARIN
Policy Officer

European Commission
DG Research & Innovation
C5- regional Dimension of Innovation

ORBN 09/009
1049 Brussels/Belgium
+32 229-55466
colombe.warin@ec.europa.eu

http://ec.europa.eu/research

From: jprousal@gmail.com [mailto:jprousal@gmail.com] On Behalf Of John Prousalidis
Sent: Tuesday, October 01, 2013 1:44 PM
MARINELIVE – 2nd Periodic Report (Months 1-42)
To: WARIN Colombe (RTD)
Cc: Lambros Kaiktsis; MARTINEZ Y FOIX Vanessa (RTD); NEGRELLI Nicola (RTD)
Subject: Fwd: MARINELIVE amendment

Dear Ms Warin

following our recent communication, please find attached the document we have prepared regarding the amendment of the contract No 264057 referring to the project (all budget shifts, amendments including the duration extension have been included). Please note that taking into account the difficult current status of NTUA, we have placed a 6-months extension (ending date: June 14, 2014) anticipating that NTUA will be able to resume within this interval.

We will be happy to answer any of your queries

John Prousalidis, Lambros Kaiktsis

---------- Forwarded message ----------
From: <Colombe.WARIN@ec.europa.eu>
Date: 2013/9/27
Subject: RE: MARINELIVE amendment
To: jprusal@naval.ntua.gr
Cc: Vanessa.MARTINEZ@ec.europa.eu, Nicola.NEGRELLI@ec.europa.eu, kaiktsis@naval.ntua.gr

Dear John,

MARINELIVE – 2nd Periodic Report (Months 1-42)
I see that the process is quite complicated. We should then start now as the project ends on December 14, 2013.

Please send us (to Nicola Negrelli, the responsible Legal Officer for Marinelive) all documents you already fulfilled on subcontracting and budget shifts (please add the request for the extension). He will then open a session in NEF.

Best regards,

Colombe

Colombe WARIN
Policy Officer

European Commission
DG Research & Innovation
Square Frère Orban, 8

ORBN 09/009
1049 Brussels/Belgium
+32 229-55466
colombe.warin@ec.europa.eu
Dear Ms Warin,

Thank you very much for your reply and your willingness to help.

I would like to offer some additional information about the procedures at our University,
as besides the Vice Rector there are several Bodies that have to approve any project contracts or amendments.

First, the amendment (or the contract) is submitted by the Project Coordinator (PC) to the Division the PC belongs

(in my case the Marine Engineering Division, part of the School of Naval Architecture and Marine Engineering).
The Assembly of the Division, comprising mainly the academic staff of the Division, approves this after a discussion upon the request of the PC. Normally, this Assembly takes place once a month.

Upon approval, the amendment is directed to the Research Committee of NTUA; there, it has to be approved once again by its Board (comprising mainly academics from all Schools of NTUA). Normally, the Assembly of the Research Committee
Board takes place once or twice a month.

Upon approval, the Director of the Research Committee Board, who is also the Vice Rector of NTUA (currently Professor Ioannis Avaritsiotis who replaced Professor Yannis Polyzos in 2011) signs the amendment which is ready to be sent to the E.C.

Now in our case, due to the strike actions, no normal operation takes place within NTUA (as I mentioned to you the main reason.
of these strike actions is that the Central Government intends to fire about 50% of NTUA's Administrative employees).

All Administrative offices are closed and no operation takes place within NTUA.

I am not sure if the above clarify the fact that the rather simple bureaucratic procedure cannot proceed at all for the time being.
In fact, I realize that, as time limits become narrower, a request from our side for an extension of the project (for about 6 months) becomes more probable. Thus, I would appreciate if you could inform me regarding the procedures and requirements for this.

I will be happy to answer any extra queries that you may have.

Best regards

John

PS please note that I can not be reached by calling my office phone; however, you can contact me by e-mail or by calling to my mobile phone (see below)