



# **NON-INTERCONNECTED ISLANDS SYSTEM & MARKET OPERATOR**

## **Project Implementation of the Athens Central Energy Control Center (ECC) and the Local ECC for the Electrical Power System in Rhodes**

### **TECHNICAL AND FUNCTIONAL REQUIREMENTS**

#### **PART F: PROJECT EXECUTION**

Athens, 28 November 2017

ECCO International, Inc.  
268 Bush Street, Suite 3633  
San Francisco, California, US 94104

## Contents

1	Introduction .....	1-1
2	Project Schedule .....	2-1
3	Project Phases .....	3-1
3.1	Project Phase A: Detailed Design .....	3-2
3.1.1	Sub-Phase A1: Project Preparation .....	3-2
3.1.2	Sub-Phase A.2: Project Detailed Design .....	3-3
3.2	Project Phase B: Implementation and FAT .....	3-4
3.2.1	Project Sub-Phase B.1: Project Implementation including Pre-FAT .....	3-4
3.2.2	Project Sub-Phase B.2: Factory Acceptance Tests (FAT) .....	3-4
3.3	Project Phase C: Installation and SAT .....	3-5
3.3.1	Project Sub-Phase C.1: Installation at NII SMO Premises .....	3-5
3.3.2	Project Sub-Phase C.2: Site Acceptance Tests (SAT) .....	3-5
3.4	Project Phase D: Trial Operation Period .....	3-5
3.5	Project Phase E: Warranty Period .....	3-6
3.5.1	Project Sub-Phase E.1: Warranty Period .....	3-6
3.5.2	Project Sub-Phase E.2: On-Site Technical Support .....	3-6
3.5.3	Project Sub-Phase E.3: Certification of the NII IT Systems. ....	3-6
3.6	Maintenance Period .....	3-7

## List of Figures

<b>Figure 3-1.</b> Indicative Project Execution Timeline	3-1
<b>Figure 3-2.</b> Detailed Project Execution Timeline	3-2

## List of Acronyms

<b>DW</b>	Data Warehouse
<b>ECC</b>	Energy Control Center
<b>EMS</b>	Energy Management System
<b>FAT</b>	Factory Acceptance Tests
<b>IT</b>	Information Technology
<b>MIS</b>	Management Information System
<b>MMS</b>	Market Management System
<b>NII</b>	Non-Interconnected Islands
<b>NII SMO</b>	Non-Interconnected Islands System and Market Operator
<b>RTU</b>	Remote Terminal Unit
<b>SAT</b>	Site Acceptance Tests

# 1 Introduction

In this document, the Project execution schedule for the implementation of the Central Energy Control Center (ECC) in Athens and the Local ECC in Rhodes, along with the descriptions of its main Phases is presented.

Section 2 presents the high-level project schedule.

Section 3 lists the Project Phases.

## **2 Project Schedule**

The Project execution for the implementation of the Central ECC in Athens and the Local ECC in Rhodes will commence upon the signing of the contract and will be delivered within eighteen (18) months. A three (3) - month trial operation is included in the Project execution period.

After the successful trial operation period, a warranty period shall commence. The Project's Warranty Period is set at twelve (12) months from the date of approval of the successful completion of the trial period.

The Final Acceptance of the Project shall be conducted after expiry of the Warranty Period on the condition that the Contractor has restored, to the full satisfaction of the NII SMO, any defective, imperfect or poor work, which has either been discovered by the Provisional Acceptance Committee, or was identified during the Warranty Period.

Assuming no delays in the Project occur the Warranty period should end after 30 months following the signing of the Contract.

The Warranty period is followed by three (3) years of maintenance period.

The maintenance responsibilities of the Contractor during the warranty and maintenance periods are contained in Part H - Maintenance Requirements of the Technical Tender Technical and Functional Requirements.

The project is contractually considered as a whole although it consists of the following subprojects that refer to the following NII IT Systems:

- Energy Management System (EMS);
- Market Management System (MMS);
- Corporate Systems:
  - DW/MIS;
  - Helpdesk.

The Project includes its integration with the existing NII infrastructure.

The Project shall be implemented in parallel at the Central ECC in Athens, and the Local ECC in Rhodes.

Due to the dependencies between the subprojects, the Contractor should have the sole responsibility to appropriately manage and synchronize the subprojects, so that the entire Project is implemented within the project time line.

### 3 Project Phases

The Project execution (after the signing of the Contract) is split in the following main Phases:

- A. Detailed Design (Section 3.1);
- B. Implementation including pre-FAT and FAT (Section 3.2);
- C. Installation and SAT (Section 3.3);
- D. Trial Operation Period (Section 3.4);
- E. Warranty Period (Section 3.5).

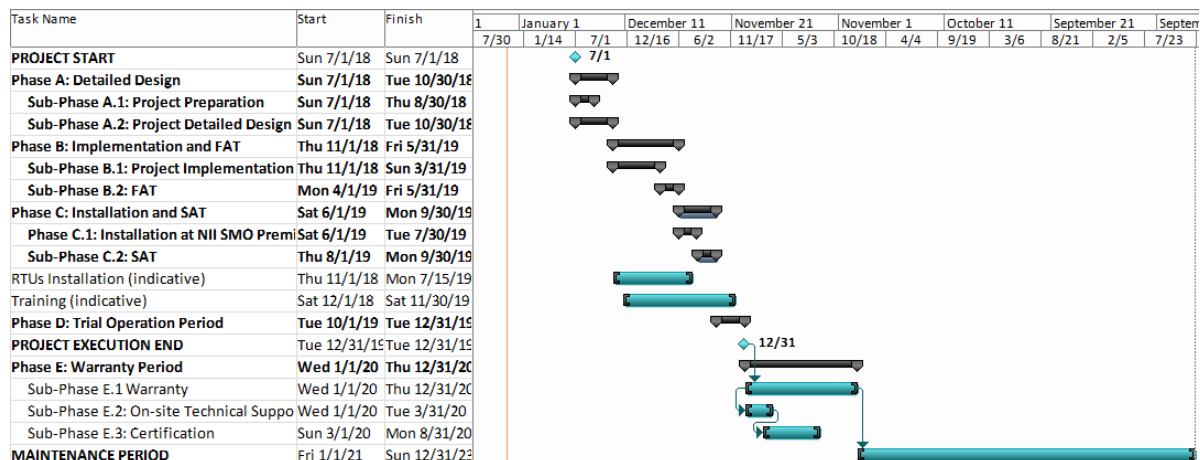
A Maintenance Period (Section 3.6) of 3 years will follow the Warranty Period.

With the exception of the Detailed Design and the Trial Period Phases, the Contractor in the Detailed Design of the Project can propose its own Project Execution Timeline and Sub-Phases for Phases B and C, on the conditions that:

- the total project execution time, until the end of the Trial Operation Period, will not exceed the 18 months;
- the deliverables for each Phase are not modified.

It noted that the Contractor may propose a more flexible (and parallel) implementation of the Datawarehouse in the Central ECC, provided that the project execution time does not exceed the 18 months.

The Figures below show an indicative timeline for the project. Figure 3-1 shows a high-level timeline including the maintenance period. Figure 3-2 shows a more detailed timeline for the Project Phases A to E (up to the Warranty Period). A description for each Phase and Sub-Phase is presented in the Sections that follow.



**Figure 3-1. Indicative Project Execution Timeline**

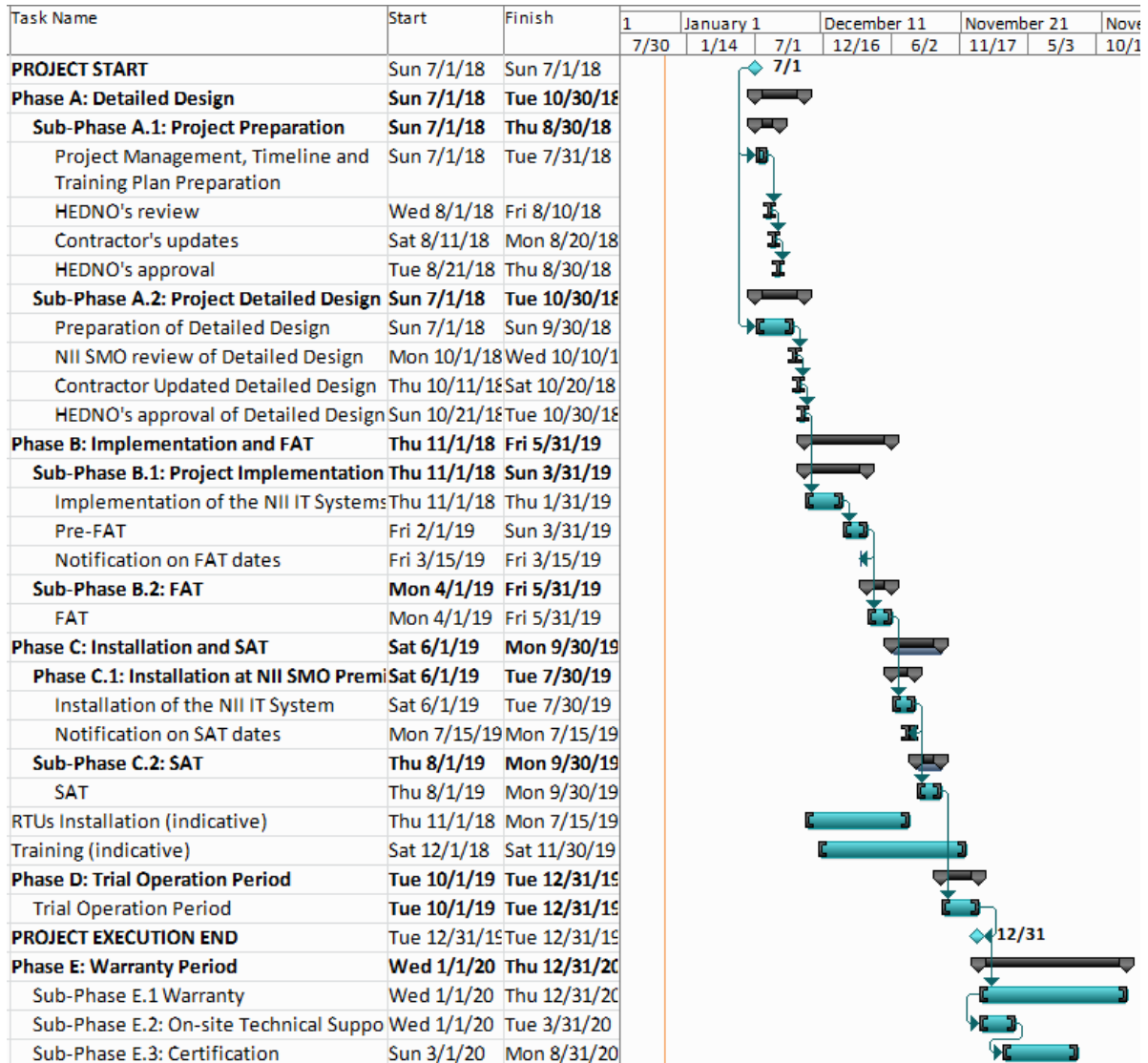


Figure 3-2. Detailed Project Execution Timeline

### 3.1 Project Phase A: Detailed Design

The duration of Phase A is 4 months. This Phase includes two Sub-Phases that should be performed in parallel. These include:

- Sub-Phase A1: Project Preparation (Section 3.1.1);
- Sub-Phase A2: Project Detailed Design (Section 3.1.2).

#### 3.1.1 Sub-Phase A1: Project Preparation

The Contractor, upon the signing of the contract, will be obliged to perform a kick-off meeting with the NII SMO, in order to establish the procedures to be followed during



the Project. These include establishing a detailed plan of communication with NII SMO, a detailed Project Execution Timeline, project management details (staffing, team structure, etc.), and a detailed Training Plan for the entire project.

The Training Plan should span Phases B, C, and D. It should also foresee that all training deliverables and documentation must end before the completion of the Phase D (Trial Period).

NII SMO retains the right to reject the Project Timeline and Training Plan if they are not fully satisfactory.

Within ten (10) calendar days upon receipt of the above, NII SMO is obligated to approve it or return it to the Contractor with its comments and suggestions. In this case, within ten (10) calendar days the Contractor is obligated to submit the updated material, according to the NII SMO comments and suggestions, and the NII SMO within ten (10) calendar days is obligated to submit its comments, otherwise the submitted plans are considered final.

This Sub-Phase should be completed the latest by the end of the 2<sup>nd</sup> month.

### **3.1.2 Sub-Phase A.2: Project Detailed Design**

Sub-Phase A.2 is the main sub-phase of Phase A, which spans the entire duration of Phase A. It should be performed in parallel with Sub-Phase A.1.

Within three (3) months after the day that the Project Contract comes into effect, the Contractor will submit to the NII SMO for approval the detailed hardware and software architecture and the drawings for the implementation of the project including the specific hardware and software products, licenses, functional specification and software customization, IP addressing scheme interfacing with existing systems that are needed for the project to become fully operational and integrated in the NII SMO infrastructure. Within this phase the Contractor will also carefully plan and design the data migration to the new EMS, so that it can be implemented according to a detailed and clear schedule and with absolute safety for the Control Centers operation.

It is important to note that this Project foresees the installation of RTUs in many Substations in Rhodes. Although the installation is foreseen to take place in Phase C, the Contractor may begin the works of RTUs installation during Phase B, provided that any wiring required to be performed by the NII SMO is completed. Therefore the Detailed Design should also include a schedule for the installation of the RTUs, in order to ensure coordination with the NII SMO personnel, and the timely installation of the RTUs for the SAT to be able to take place with all equipment installed.

NII SMO retains the right to reject the detailed design if it is not fully satisfactory.

Within ten (10) calendar days upon receipt of the Detailed Design, NII SMO is obligated to approve it or return it to the Contractor with its comments and suggestions. In this case, within ten (10) calendar days the Contractor is obligated to submit the updated Detailed Design, according to the NII SMO comments and

suggestions, and the NII SMO within ten (10) calendar days is obligated to submit its comments, otherwise the Detailed Design is considered as approved.

This Sub-Phase should be completed by the end of the 4<sup>th</sup> month.

## **3.2 Project Phase B: Implementation and FAT**

The duration of Phase B is 7 months. This Project Phase consists of two sub-phases:

- Sub-Phase B.1: Project Implementation including Pre-FAT (Section 3.2.1);
- Sub-Phase B.2: FAT (Section 3.2.2).

### **3.2.1 Project Sub-Phase B.1: Project Implementation including Pre-FAT**

The Implementation Period should start just after the Detailed Design is approved and it is estimated to last five (5) months. During this period all NII IT Systems functions that have been agreed upon during the Detailed Design Phase should be implemented. Following the implementation of the software, Pre-FAT of all unit functions will be completed. The testing scenarios for the unit testing will be designed by Contractor. Pre-FAT will be completed at the Contractor's site. They are estimated to last about two months. HEDNO may monitor the testing progress mainly for training purposes. Also, within this period the data migration from the existing infrastructure to the new NII IT Systems will be implemented, according to the respective requirements. RTU installation and Training may also take place during this Sub-Phase.

This Sub-Phase should be completed by the end of the 9th month from the signing of the Contract.

### **3.2.2 Project Sub-Phase B.2: Factory Acceptance Tests (FAT)**

The FAT should start after the end of the Implementation Period at the Contractor's premises. This Sub-Phase is expected to last two (2) months. On the condition that the Contractor has performed successful pre-FAT tests, the Contractor shall notify the NII SMO in writing, at least fifteen (15) days before the date when the system shall be ready for the Factory Acceptance Testing with the participation of NII SMO's personnel. The testing procedures are described in Part G - Testing, Performance and Availability of the Technical Tender Technical and Functional Requirements. The NII SMO will participate in the testing and draft variances if necessary. The Contractor will resolve variances and make the system available for re-testing of these variances. Within this period, all necessary corrections will also be implemented so that FAT could be concluded in a successful manner.

This Sub-Phase should be completed by the end of the 11th month.

### **3.3 Project Phase C: Installation and SAT**

The duration of Phase C is 4 months. This Project Phase consists of two sub-phases:

- Sub-Phase C.1: Installation at NII SMO Premises (Section 3.3.1);
- Sub-Phase C.2: SAT (Section 3.3.2).

#### **3.3.1 Project Sub-Phase C.1: Installation at NII SMO Premises**

The installation of the system at NII SMO premises will commence after the successful completion of FAT. This Sub-Phase is expected to last two (2) months. During this period all hardware and software specified in this document, as updated during the Detailed Design Phase or during the project execution, will be installed at the respective NII SMO premises (Central ECC in Athens, and Local ECC in Rhodes) and put in operation. This period includes all actions required (transportation, storage, etc.) for the installation and put in operation.

This Sub-Phase should be completed by the end of the 13th month.

By this time the system should be fully integrated into NII SMO facilities and be fully operational and ready for performing the SAT testing.

#### **3.3.2 Project Sub-Phase C.2: Site Acceptance Tests (SAT)**

The SAT should start after the end of the installation of system at NII SMO premises. The SAT testing involves the end-to-end testing of the entire installed enterprise hardware and software. The NII SMO personnel will participate in the creation of the testing scenarios and the production of the actual operational testing data. This sub-phase is expected to last two (2) months. The Contractor shall notify NII SMO in writing, at least fifteen (15) days before the date when the system shall be ready for testing with the participation of NII SMO's personnel, and according to the procedures described in Part G - Testing, Performance and Availability of the Technical and Functional Requirements. Within this period all necessary corrections, will also be implemented so that SAT could be concluded as successful.

This Sub-Phase should be completed by the end of the 15th month.

After the successful execution of SAT, the systems will be prepared for launching the Trial Operation period.

### **3.4 Project Phase D: Trial Operation Period**

The duration of Phase D is 3 months. It does not include sub-phases. Throughout this period all the implemented System and Market Operations, and Corporate Services Systems will become fully integrated with the NII SMO infrastructure and the parallel operation with the old systems will commence. At the end of this period the old systems will be phased out. Also during this Phase Market Participants will be involved to test the installed systems. Identified variances will be resolved and

updated software will be installed if necessary. All training and documentation deliverables should be provided during this Phase or earlier.

This Phase should be completed by the end of the 18th month.

### **3.5 Project Phase E: Warranty Period**

The Duration of Phase E is 12 months. This Phase consists of the following Sub-Phases.

- Sub-Phase E.1: Warranty Period (Section 3.5.1);
- Sub-Phase E.2: On-Site Technical Support (Section 3.5.2);
- Sub-Phase E.3: Certification of the NII IT Systems (Section 3.5.3).

#### **3.5.1 Project Sub-Phase E.1: Warranty Period**

This sub-phase is the main sub-phase of Phase E which spans its entire duration (12 months). It should be running in parallel with Sub-Phases E.2 and E.3.

The warranty period should start immediately after the successful completion of the Trial Operation Period. It should last for one year.

Requirements for this period are provided in Part H - Maintenance Requirements of the Technical Tender Technical and Functional Requirements.

This Sub-Phase should be completed by the end of the 30th month.

#### **3.5.2 Project Sub-Phase E.2: On-Site Technical Support**

In parallel with the Warranty Period (Sub-Phase E.1), a 3-month period is foreseen during which the Contractor should provide on-site technical support and assistance to the NII SMO staff. At least one experienced engineer should be located at the NII SMO premises in Athens and in Rhodes (one in each location) and present during working hours. The Contractor's personnel should meet the requirements for the Technical Support as stated in Part H - Maintenance Requirements of the Technical Tender Technical and Functional Requirements.

This Sub-Phase should be completed by the end of the 21st month.

It is clarified that during but also after the end of this sub-phase, the warranty period is still valid, and technical support should be provided whenever and wherever required.

#### **3.5.3 Project Sub-Phase E.3: Certification of the NII IT Systems.**

Two months after the beginning of the Warranty Period (Sub-Phase E.1) and one month before the end of the on-site technical support (Sub-Phase E.2), the Certification of the NII IT Systems shall be performed by an Independent Authority. The Contractor is expected to provide assistance to the NII SMO for the successful

completion of the NII IT Systems certification. This assistance will consist of resolving any identified variances and updating the software as required.

It is expected that this sub-phase should be completed by the end of the 26th month.

### **3.6 Maintenance Period**

As already noted in Section 2, the Warranty period (Phase E of the Project Execution) will be followed by three (3) years of the Maintenance Period.

The maintenance responsibilities of the Contractor during the Maintenance Period are contained in Part H - Maintenance Requirements of the Technical Tender Technical and Functional Requirements.

Assuming that no delays occur, the Maintenance Period should be completed by the end of the 66th month following the signing of the Project Execution Contract.