



**First Scientific Committee Meeting for the Four Season
Oceanographic Cruise – 2016
Doha, State of Qatar, 13-14 September 2015**

INTRODUCTION

In accordance with Decision CM 16/6 of the Council-16, the First Scientific Committee Meeting for the Four Season Oceanographic Cruise – 2016 was held in Doha, State of Qatar during 13-14 September 2015, in partnership with the Environmental Science Center of the University of Qatar (UQ – ESC), under the MOU signed between ROPME and Qatar University.

As recommended during the Preparatory Meeting for the Four Season Oceanographic Cruise – 2016 (FSOC 2016) held on 25–27 May 2015 at Tehran, I.R. Iran, the ROPME Secretariat has formed a Scientific Committee of regional experts in oceanography to elaborate the Terms of Reference (TORs) for initiating the preparations for the FSOC 2016. The Scientific Committee has been invited to this Meeting with the main objective to review the TORs and the Cruise Plans and to propose the Scientific Programme for the Cruise and an elaborate Time-Table for all activities and requirements in preparing for and implementing of the Four Season Oceanographic Cruise.

ATTENDANCE

The First Scientific Committee Meeting was attended by representatives of National Focal Points (NFPs), Qatar University, invited oceanographic experts from the Region and the Professional Staff of ROPME. Two Staff members from the Environmental Science Center (ESC) of Qatar University also attended the opening session. The List of Participants is attached as Annex I.



AGENDA ITEM 1: OPENING OF THE MEETING

- 1.1 The Meeting was opened at 9:00 a.m. on Sunday, 13 September 2015 with a welcome statement by Dr. Bhanu Chowdhary, Associate Vice President for Strategic Research Initiatives, Research Office on behalf of Qatar University, who delivered an address on the plans of the Environmental Science Center, Qatar University .He emphasized that the Center is research-oriented, enabling knowledge transfer and training for the academic educational programmes of the university. He welcomed the opportunity for potential collaboration between Qatar University and ROPME, including the use of the university's research vessel, *RV/ Janan*, as the potential cruise platform for the FSOC 2016.

- 1.2 On behalf of ROPME, Dr. Hassan Mohammadi, ROPME Coordinator welcomed the participants and conveyed the warm greetings of H.E. Dr.Abdul Rahman Al-Awadi, Executive Secretary of ROPME.

In his statement, Dr. Mohammadi gave an introduction on the past oceanographic cruises in the RSA and some early oceanographic cruises in the Red Sea. He outlined the outcomes of the ROPME cruises and the challenges faced during the cruise planning and

implementation. He stressed the need to plan for the FSOC 2016 considering the lessons learnt from the previous ROPME and other cruises. He further encouraged looking into recent developments in marine environmental science and technology for planning the cruise methodologies and instrumentation. The need for a four season cruise to provide comprehensive information on the state of the marine environment all year round was also highlighted.

AGENDA ITEM 2: ORGANIZATION OF THE WORK

2.1 Election of Chairman and Rapporteur

Dr. Jeffrey Obbard, Qatar University, served as the Moderator and Dr. Abdulaziz Al-Suwailem, King Abdullah University of Science and Technology, as the Rapporteur for the Meeting.

2.2 Introduction of Participants

The participants introduced themselves to the Meeting by name, agency and area of expertise.

2.3 Adoption of the Agenda

The Meeting's agenda as prepared by the ROPME Secretariat was circulated to the attendants. Dr. Mohammadi briefly explained the agenda items. After the review and a brief discussion, the agenda was adopted without change. However, the agenda was later amended by rescheduling the planned visit to *RV Janan* on the second day due to a change in the issuance of permit for port access (Annex II).

AGENDA ITEM 3: REVIEW OF PAST OCEANOGRAPHIC CRUISES IN THE REGION

3.1 ROPME Oceanographic Cruise – Winter 2006

In an oral Presentation, Dr. Nasrollah Soofiani, NFP-Iran

Representative, spoke about the ROPME 2006 Cruise. As the cruise leader for the 2006 Cruise Leg from Bandar Abbas, Iran to Doha, Qatar, he assessed that the onboard tasks were well executed and the cruise participants generally performed well. However, he identified some issues and challenges encountered during the 2006 cruise as follows:

- Difficulties in issuance of permits from some Member States and that territorial waters were excluded from coverage of the cruise.
- Insufficient time for some necessary preparations on instrumentation and logistics. Hence, he proposed to conduct the FSOC 2016 in 2017 or late 2016.
- Issues with the quality of collected samples because of the inexperience of some of the sample collectors onboard.
- Some onboard cruise participants were without previous relevant experience/training; hence, he recommended the need for training of young and inexperienced participants prior to the start of the FSOC 2016.
- Cruise leaders and task leaders should meet prior to the start of the cruise to discuss the details of the cruise plan.
- Some equipment items, especially those intended for backup, were either missing or not suitable for the intended work.
- Some of the cruise leaders and task leaders felt exhausted due to the long duration of the cruise legs.
- Schedule all sampling activities during daytime only from sunrise to sunset.

Dr. Mohammadi commented on the challenges mentioned by Dr. Soofiani, and stressed the need for the Scientific Committee to bring effective solutions through better planning, in considerations of the lessons learned from the past cruises.

Dr. Abdul Nabi Al-Ghadban, ROPME invited expert, mentioned the need for local expertise with very good experiences in oceanographic cruises, and at the same time provide opportunities for junior participants to gain experiences and training.

3.2 Red Sea Experience

In his presentation, Dr. Abdulaziz Al-Suwailem, ROPME invited expert, presented the experiences of King Abdullah University of Science and Technology (KAUST) in conducting oceanographic cruises in the Red Sea and the Mediterranean. He presented examples of KAUST oceanographic cruises from 2008 to present, highlighting the scope of research, major equipment used, and several significant discoveries during these cruises. Dr. Al-Suwailem also elaborated on how KAUST administers scientific cruises, often with the participation of scientists from different countries. He explained the steps and procedures for enabling scientific oceanographic cruises, with emphasis on the strategic sequence of actions (scoping of studies, timing, and spatial coverage of the cruise, development of cruise plan, permit application, pre-cruise preparations, and cruise implementation) to ensure success in administering a cruise.

Dr. Al-Suwailem emphasized the need to initiate the cruise organizing effort by first scoping up the scientific studies through initial meetings among principal investigators, after which the key equipment and logistical requirements are identified. Such information subsequently leads to cruise planning whereby the cruise itineraries and detailed sampling programme are normally required for the acquisition of relevant permits. The cruise planning stage should also include the development of appropriate safety guidelines and quality assurance protocols. The necessary preparations, which follow after the cruise plan has been set, include appropriate actions to ensure the readiness and availability of the required equipment, chemicals, supplies, and permits. Vessel loading and unloading plans as well as the travel arrangements for cruise participants are also critical considerations that can surprisingly impact on cruise timetable. Other important considerations for cruise planning and preparations are sample handling, storage, and transfer; cruise data management; and the availability of onboard competence for sampling operations and equipment repair.

Dr. Al-Suwailem drew crucial attention to the proper scheduling of major tasks, particularly the need to complete the cruise plan early to meet the requirements for permit applications. For instance, Saudi Arabia

requires that cruise permit applications should be submitted not later than six (6) months from the start date of the cruise and the cruise permit application template requires cruise plan details (e.g. itinerary with maps and coordinates, list of major equipment, list and details of participants, sampling activities, etc.). In view of such consideration, he suggested that the FSOC 2016 should conveniently start in January 2017 to allow for proper cruise planning and preparations. In addition, starting the cruise in January achieves a nice sequence of seasonality, which is the primary target of the FSOC 2016.

3.3 North of RSA Experience

Dr. Ali Douabul delivered a presentation on the oceanographic cruise conducted by the Republic of Iraq in the northern RSA (Iraqi waters), which measured seawater physicochemical parameters (e.g. water temperatures, salinity and nutrients), levels of contaminants (trace metals and petroleum hydrocarbons), as well as sampling and photography of some biological components (plankton, benthos, fish and corals) (see Annex III for details).

Dr. Al-Ghadban commented that he was not aware of any previous occurrence of corals in the Iraqi waters, which were believed to be below the temperature limits for coral growth during winter. He suggested that if these corals are recent settlers in the studied area then it merits further investigation in relation to climate change/global warming.

3.4 R/V Janan Characteristics and Capabilities

Dr. Jeffrey Obbard characterized the emerging nature of modern marine research, which is becoming more multidisciplinary or interdisciplinary. He cited that the Qatar University research vessel, *RV Janan*, can be used for conducting the FSOC 2016. He pointed out that a Memorandum of Understanding (MoU) has been signed between ROPME and Qatar University. However, the use of "*Janan*" as the research vessel for FSOC 2016 has not been finally decided nor contracted between the two organizations.

AGENDA ITEM 4: RECOMMENDATIONS OF THE PREPARATORY MEETING OF THE FOUR SEASON OCEANOGRAPHIC CRUISE 2016

4. Dr. Hassan Awad, ROPME Expert, explained the overall objective of the FSOC 2016 as recommended during the Preparatory Meeting, which was “To assess the environmental characteristics of the RSA, in order to determine the Environmental Quality Objectives (EQOs) and to identify and implement preventive and curative actions/interventions towards suitable development in the Region”. The members, however, were of the opinion that the implementation of preventive and curative actions was beyond the scope of FSOC 2016.

Dr. Awad also mentioned the specific objectives of the FSOC 2016, as recommended during the Preparatory Meeting which are:

1. To carry out oceanographic studies for characterizing the dynamics, Physical and Chemical properties of the RSA;
2. To assess the temporal and spatial variations of nutrients in water column and sea bed sediment;
3. To determine the distribution of contaminants/pollutants in the RSA;
4. To investigate the abundance, biomass and species composition of plankton communities;
5. To investigate the abundance, biomass and species composition of benthic communities;
6. To contribute to better understanding of the status and trends of the marine environment towards developing management tools and environmental modeling;
7. Formulate a Regional Ecosystem Model based on the observed seasonal abiotic and biotic information;
8. Establish an Ecological Model for each of the four seasons and for the whole year for the marine environment in the RSA, and possibly extend to biogeochemical modeling; and
9. Collect surface and core sediments for continuing the assessment of contaminants and reconstruction of their history, and also for the

reconstruction of radiation and cysts history in the RSA.

The Committee members considered the above specific objectives as good reference for finally setting the upcoming cruise objectives. He stressed that one of the key objectives of the FSOC 2016 is to maintain the ROPME effort to sustain an accurate assessment of the different contaminants level in the offshore areas of the RSA through ROPME oceanographic cruises series.

Dr. Awad also presented a comprehensive review of past oceanographic cruises conducted by ROPME. The presentations included the scope and coverage of each cruise, and challenges faced during the planning, logistical preparations, and execution of the cruises.

According to the lessons learned from past experiences, he presented three scenarios for conducting the FSOC 2016 as follows:

- I. Scenario I: FSOC 2016 to cover the whole area of the RSA, including 27 offshore stations of those surveyed during the ROPME 2006 cruise and with additional 3 offshore stations in the Sea of Oman. The cruise track is estimated to be about 7,000 km long.
- II. Scenario II: FSOC 2016 to focus only on 26 of offshore stations covering the same surveyed area in the previous ROPME cruises with an estimated total track length of about 3,200 km.
- III. Scenario III: FSOC2016 to focus only on a series of offshore tracks covering the I-RSA and M-RSA with a total of 33 stations and track length of 4,000 km.

Dr. Awad provided estimates of the cruise duration (number of days)for each cruise scenario. He suggested the FSOC 2016 to be scheduled as follows:

- Winter Cruise: Mid-January – Mid-February
- Spring Cruise: Mid-April – Mid-May
- Summer Cruise: Mid-July – Mid-August
- Autumn Cruise: November

Dr. Awad also mentioned that the samples from the previous cruise

were analyzed by external laboratories commissioned by ROPME (See Agenda - item 10).

Dr. Awad and the Scientific Committee members discussed the experiences from the previous cruises, including possible ways to overcome the encountered issues and challenges. The cruise scenarios proposed by Dr. Awad were also discussed and taken as reference and potential options for the FSOC 2016.

Dr. Awad ended his presentation by a proposal for providing supplementary data and information on certain issues and environments of special interest for the RSA, the proposal includes six additional sub-projects which could be carried out parallel to the onboard activities during 2016. These sub-projects are:

- Assessment of Shatt Al-Arab discharge (monthly assessment or less)
- Monitoring and assessment of fallen dust impacts on the marine environment of the RSA
- Water exchange through the Strait of Hormuz
- Low Energy Environment
- Ground truth of RS images
- History Reconstruction of:
 - Contaminants (Oil, TBTs, etc..)
 - Radiation
 - HABs' Cysts
- Training of human resource

The presentation by Dr. Awad is appended as Annex III.

It was suggested that ROPME cruises could be conducted every 3 to 4 years. However, it was concluded that such cruise frequency is not feasible due to the time required for cruise preparations, analysis of samples, and technical publication before the next cruise.

Dr. Al-Ghadban emphasized the need to scope up the studies for the FSOC 2016 in line with the ROPME priorities and the selection of studies should be availability of resources.

AGENDA ITEM 5: INTERFACE OF THE CRUISE PROGRAMME WITH OTHER ROPME ACTIVITIES

The afternoon session started with a discussion about interfacing the FSOC 2016 cruise programme with some important studies which were proposed by Dr. Awad during his presentation, i.e. Water Circulation at the Strait of Hormuz, Assessment of SDS Impacts on the Marine Environment of the RSA, and Reconstruction of Pollution History in the RSA. The objectives, scope, and requirements of each of these studies were subsequently discussed.

5.1 Study of Water Circulation at the Strait of Hormuz

The study on Water Circulation at the Strait of Hormuz was considered crucial in understanding the interaction of the inner RSA environment with the open sea (Arabian Sea). It provides important information on understanding water masses and circulation in the inner RSA, including better estimation of residence times of the RSA water masses. However, it was concluded that the proposed deployment of moored water current profilers (Acoustic Doppler Current Profilers) at discrete locations across the strait is a major challenge, considering the heavy vessel traffic through the strait. It was also suggested that previous publications on water circulation across the strait need to be reviewed and considered in scoping the currently proposed study, which remains subject to the review and approval of the Scientific Committee.

5.2 Assessment of SDS Impacts on the Marine Environment of ROPME Sea Area

While the Scientific Committee deem the Assessment of SDS Impacts on the marine environment of the ROPME Sea Area will mainly focused on waters within the jurisdictions of two or three countries, it is considered as an important topic to understand the productivity and ecology of the northern part of the inner section of the RSA as long as the study does not entail tremendous cost and effort.

5.3 Reconstruction of Pollution History in the RSA

The committee members unanimously agreed on the significance of the

Reconstruction of Pollution History in the RSA to understand the chronological historical records of contamination events in the area and to delineate recent events between anthropological and natural sources. Dr. Al-Ghadban stressed that this study is relatively not demanding in terms of sampling effort and time, as it requires collecting a limited number of sediment cores (possibly 2-3 cores) in the central offshore part of the inner RSA. The members agreed to conduct the study during the cruise, if possible, to include analysis of contaminants, radionuclides, and cysts related to harmful algal blooms (HABs). It was suggested that the full scientific scope of this study has to be prepared and presented to the committee for review and approval

AGENDA ITEM 6: REVIEW OF THE ROPME 2016 CRUISE PLANS

6. The FSOC 2016 cruise plans, including the scientific programme; health, safety and environmental (HSE) plan, and quality assurance plan (QAP), was presented by Dr. Awad. The members agreed that the HSE plan and QAP, which were based from the previous cruise in 2006 can be suitably adopted for the FSOC 2016, but may be revised further depending on the scope of studies to be finally decided for the cruise.

AGENDA ITEM 7: ORGANIZATION AND MANAGEMENT OF THE CRUISE 2016

7. The discussion focused on ways to organize and manage the FSOC 2016 at all stages of implementation, i.e. considering all activities before, during, and after the cruise. After a long discussion, the emergent consensus recognized the large scale and scope of the FSOC 2016, which consists of representative sites covering the whole RSA over different seasons, caters to multiple studies, and involves different stakeholders from different Member States. Hence, it was proposed that the organization and management of the FSOC 2016 should be treated as a multi-component programme, with each component requiring dedicated attention and action. As such, there should be a clear management structure to effectively handle the planning and execution of the programme in terms of scientific, logistical, financial, and demonstrative aspects.

In the above context, Dr. Al-Suwailem suggested that the FSOC 2016

should have a Programme Director, assisted by a Chief Scientist who shall work with a small team of experts from the Region to develop the scientific scope and objectives of the cruise as well as identify specific requirements (equipment, chemicals and sampling requirements) for cruise implementation. The Chief Scientist shall work with the experts to develop the Cruise Plan and related requirements. The Programme Director shall focus on the planning and implementation of administrative tasks, such as on logistics, procurement, permitting, etc. The Programme Director and Chief Scientist shall develop a Programme Plan that assigns responsibilities and specifies the timetables for achieving target milestones, work completion, deliverables, dependencies, and contingencies. The programme timetable should be regularly tracked and/or updated and the Programme Director is responsible to ensure that all delegated tasks are completed according to schedule.

AGENDA ITEM 8: CRITERIA FOR SELECTION OF CRUISE PARTICIPANTS

8. As earlier discussed, one of the lessons learned from the past ROPME cruises was the need to select experienced cruise participants to adequately execute the different sampling activities onboard the vessel during all four cruises. Having well qualified participants onboard the vessel ensures the collection of high quality data or samples and the proper and safe operation of sampling instruments. There was unanimous consensus that this is a critical factor to achieve success for the FSOC 2016. However, it was also suggested that the FSOC 2016 should equally serve as a platform for developing or training new talents and provide opportunities for new interests. The Chief Scientist and experts shall develop the criteria and guidelines for the selection of cruise participants, considering both objectives.

AGENDA ITEM 9: PARTNERSHIP AND COMMITMENT OF MEMBER STATES TO THE CRUISE 2016

9. Reference to the faced obstacles during the previous cruise, the Meeting focused on the importance of cooperation between Member

States towards achieving historical FSOC 2016 successfully. Mainly, the areas for which cooperation and commitment are needed are identified as follow:

- Nomination of participants with experience in offshore marine monitoring and sufficient scientific background in one of marine study fields
- Facilitate issuing visa for participants in the cruise
- Facilitate issuing of permit for sample collection in national territorial waters
- Loaning needed tools and equipments during the period of the cruise

AGENDA ITEM 10: ADOPTION OF GENERAL FRAMEWORK FOR SAMPLE ANALYSES AND DATA MANAGEMENT

10. Dr. Mohammadi stated that tremendous time, cost and effort shall be allocated to organize and execute the FSOC 2016, hence, the quality of sample analysis and data collection must be of high standards. He mentioned that ROPME developed a process for selecting the laboratories that analyzed the samples collected during the previous cruise. Dr. Awad described the process of sample handling and analysis, including proper storage at the ROPME Headquarters following standard protocols for sample preservation and storage. For the analysis of samples, ROPME invited renowned international laboratories, which were then subjected to prequalification and evaluation based on technical capabilities, experiences, and cost. All samples were then sent to the selected laboratories for analysis. All analytical results and data were stored according to the data management protocol at ROPME and the results were published in various reports of specific technical topics. The reports were distributed to the NFPs of Member States. The members approved of the ROPME approach in selecting the laboratories for sample analysis. It was noted that the data management protocol can be further reviewed during and after the cruise by the expert team to ensure that the quality of resulting cruise data sufficiently meet the scientific expectations and data quality objectives.

AGENDA ITEM 11: TIME-TABLE FOR THE PREPARATIONS AND IMPLEMENTATION OF THE CRUISE 2016

11. The feasibility of conducting the FSOC during the year 2016 was the focus of discussion in different sessions throughout the Meeting duration. It was finally recommended that the FSOC should be conducted in late 2016 (autumn season) or starting with the winter cruise in January 2017, to allow for ample time in planning and preparations for the entire cruise programme. Dr. Al-Suwailem suggested a trial cruise to be conducted during the later part of 2016 to test sampling equipment and vessel capabilities, vessel familiarization, and provide training to participants, if necessary. It was recommended that ROPME put forth a plan for the cruise programme, with schedules, to be reviewed in the Scientific Committee Meeting.

AGENDA ITEM 12: POST-CRUISE ACTIVITIES

12. The post-cruise requirements and activities are assigned to the team of experts, which shall deliberate on the subject and report to the Scientific Committee accordingly.

AGENDA ITEM 13: RECOMMENDATIONS

- 13 Overall, the deliberations through the duration of the first Scientific Committee Meeting for the FSOC 2016 arrive at the following recommendations:
 1. A small team of experts from the Region shall be identified and subsequently work with ROPME on scoping the scientific studies and general requirements for the cruise. Nomination of experts for this task to be finalized by the end of September 2015.
 2. The team of experts shall compile all proposed studies and general sampling requirements for the cruise and submit a summary to the scientific committee members one month prior to the next committee Meeting for review and approval.
 3. The next Meeting of the Scientific Committee is scheduled to be during 15-16 December 2016 in Doha, State of Qatar.

4. The chief scientist with the team of experts shall develop the Cruise Plan after approval of the scientific scope, including studies, timing, and spatial coverage, by the Scientific Committee. The team of experts shall coordinate with PIs or proponents of the different studies for the cruise planning process.
5. ROPME shall develop a cruise programme plan with schedule of all major tasks for organizing the cruise from beginning to end, including assignment of responsibilities and setting the timetable for achieving milestones, deliverables, dependencies, contingencies, etc.
6. ROPME shall organize a small team composed of the cruise Programme director, chief scientist, and pool of experts from the Region to plan, manage the cruise and assist the execution. Such a group shall work with ROPME in enabling the cruise programme from beginning to end. The primary role of the group is to ensure adequacy of focused attention on implementing various tasks, in line with the cruise timetable.
7. The FSOC shall be conducted in either late 2016 with autumn season or in 2017, starting with the winter cruise in January 2017, to allow for ample time for cruise planning and preparations.
8. A short trial cruise shall be conducted in mid 2016 for testing equipment and vessel capabilities, familiarization of the vessel by the cruise and stakeholders, as well as for training of young or inexperienced participants on sampling operations and sample handling. The selected cruise leaders and task leaders shall meet and participate in the trial cruise, when necessary.
9. The cruise programme shall accommodate important scientific studies, i.e. Water Circulation at the Strait of Hormuz, Assessment of SDS Impacts on the Marine Environment of the RSA, and Reconstruction of Pollution History in the RSA. The committee shall review and approve the scope and requirements of the three studies and any other suggested studies in its next Meeting.
10. Sampling of Macrobenthos is to be carried out once only during the cruise, specifically during summer in the Inner RSA and during winter in the Sea of Oman.
11. An International Conference is to be organized in 2020 to present the results of the cruise. ROPME and the team of experts shall evaluate the feasibility of this recommendation.

AGENDA ITEM 13: CLOSURE OF THE MEETING

- 13 The Meeting was formally adjourned on Monday, 14 September 2015, at 12:00 noon. Immediately after the Meeting, the members proceeded to the Qatar Port for a visit of the research vessel, *RV Janan*.

AGENDA ITEM 14: VISIT TO R/V JANAN

14. Immediately after the Meeting, the Scientific Committee members proceeded to the Qatar maritime port to visit the research vessel *RV Janan*. During two hours visit, Dr. Ebrahim Al-Ansari of ESC-QU who guided the members during the visit by briefing on the oceanographic programme activity of the ESC using the vessel and some results of the regular survey in Qatari waters. He explained the engineering and operational features and characteristics of *R/V Janan*. Then, he showed the existing equipment and facilities on the deck area for sampling, laboratories, samples storage facilities and accommodation.



The general impression of the Scientific Committee is that the *R/VJanan* is enough suitable for the implementation of the scientific plan of the FSOC 2016.

