

## **TERMS OF REFERENCE**

### **TECHNICAL SUPPORT TO MAINTAIN SEISMIC STATIONS INDIVIDUAL CONSULTANT**

#### **Time-Based Contract**

#### **PACIFIC RESILIENCE PROGRAMME (PREP I)**

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### **1. BACKGROUND**

The Pacific Island Countries are highly exposed to adverse natural events, including tropical cyclones, earthquakes, volcanic eruptions, and tsunamis, which affect socio-economic development. This was clearly illustrated in recent events in the Pacific resulting in significant damage and losses. The tsunami that struck the North Coast of Papua New Guinea, in 1998, following a 7 magnitude earthquake caused the loss of 1,600 lives and displacing approximately 10,000 people. In 2009, a tsunami also struck Samoa and Tonga following a magnitude 8.1 earthquake killing at least 149 in Samoa and 9 in Tonga. While in Solomon Islands the earthquake and tsunami that struck in 2007 and 2013 resulted in the loss of about 62 lives. In Vanuatu, the active volcanoes cause frequent damage to property, agricultural crops and evacuation of surrounding villages. The cost of damage and loss to infrastructure, villages and local economy is quite significant stressing the importance to improve early warning forecasting and preparedness.

The "Framework for Resilient Development in the Pacific" provides an integrated approach and commitment by the Pacific countries to strengthen regional and national cooperation to implement climate change and disaster risk management actions to build resilience. The Pacific Resilience Programme (PREP) complements the objectives of the framework in providing a platform to strengthen resilience to hazards and disasters. There are a number of initiatives being implemented to strengthen early warning systems and preparedness.

All PREP countries (Vanuatu, Samoa, Marshall Islands and Tonga) are vulnerable to earthquake related hazards with active volcanoes within their territories or in close proximity. Countries have been involved in strengthening their multi-hazard early warning systems to earthquake related hazards through a number of initiatives that include infrastructure development, installing seismic equipment to improve forecasting, evacuation plans, information sharing, Standard Operating Procedures etc. both at national and regional levels. The Melanesian countries manage a regional seismic network that also include sharing of technical resources across countries. In addition, the Oceania Regional Seismic Network (ORSNET) provides similar support covering a wider group of Pacific Island countries. PREP is providing technical support to countries in improving

preparedness through strengthening impact-based forecasting and early warning systems.

Countries that have seismic instruments installed work closely with a number of partners to support procurement and maintenance of the instruments. ORSNET is a regional initiative aimed at mitigating earthquake and tsunami hazards implementing a number of initiatives that include sharing data and strengthening forecasting systems through improving earthquake detection and tsunami warning. The ORSNET seismic network include seismic stations across a wide group of Pacific Island countries ensuring faster real time monitoring and warnings. The regional collaboration under ORSNET supports the Pacific Tsunami Warning System (PTWS) and include international partners such as Geological Geophysical and Nuclear Sciences of New Zealand, Geosciences Australia, PTWS of Hawaii and Intergovernmental Oceanographic Commission of United Nations Educational Scientific Cultural Organization. The Secretariat of ORSNET is the Vanuatu Meteorology and Geohazards Department.

The PREP project has allocated some funds to support the upgrade of the seismic network in the PREP countries to maintain the seismic instruments and build capacity in targeted countries. Consultants to be recruited must be familiar with the seismic instruments deployed in ORSNET countries for maintenance purposes and train national operators. Consultants will mobilise when a request is made and approved through the ORSNET Secretariat. This facility would be available for PREP countries.

## **2. OBJECTIVE OF THE ASSIGNMENT**

The objective is to strengthen the capacity of the technical institutions in the PREP countries and other Pacific IDA countries in forecasting, monitoring and detection of volcanic activity, earthquakes, tsunamis and volcanic activities targeting PREP countries. The initiative will improve preparedness and tsunami warnings at regional, national and local levels. This approach will ensure consultants are mobilized at short notice responding to a request from the country.

## **3. SCOPE OF SERVICES AND DESCRIPTION OF TASKS**

The scope of work will include installing, maintaining seismic and tsunami early warning systems, training, and providing technical advice, working closely with technical agencies in countries responsible for their respective geohazard networks. More specifically the consultant will:

- Provide technical assistance and mentoring to strengthen and maintain multi-hazard early warning systems including seismic and tsunami monitoring networks and systems;
- Strengthen real-time data collection and transmission including system automation;
- Provide effective coordination and integration with national multi-hazard early warning systems and with ORSNET; Melanesian Volcanic Network including other geohazard networks;

- Harmonisation and inter-operability of seismic and early warning dissemination systems between ORSNET countries; and
- Provide capacity building support to seismic, volcano and tsunami monitoring network operators and early warning systems, be on call for advice on maintenance and provide training to boost capacity to manage the equipment and systems in place.

#### **4. EXPECTED OUTCOMES AND DELIVERABLES**

The consultant is expected to provide technical advice and undertake maintenance of seismic and tsunami early warning systems including training working in collaboration with technical agencies in countries. The key deliverables and reports to be developed include:

- i) Scope of Work covering country request and mission objectives;
- ii) Prepare training materials;
- iii) Install and/or maintain seismic/tsunami equipment;
- iv) Report on completion of deployment covering key observations and work undertaken for each country visited.
- v) System operations, operational procedures and maintenance manuals.

#### **5. REQUIRED QUALIFICATIONS**

Minimum requirements include:

- a. A degree in electrical engineering or related degree;
- b. Minimum five years experience in installing/maintaining seismic, tsunami and volcano monitoring equipment, computer programming and networking;
- c. Good knowledge and experience on the operating environment of the Pacific Island countries for seismic, volcano and tsunami monitoring systems and early warning systems;
- d. Familiarity with the seismic and tsunami early warning systems in ORSNET countries;
- e. Interpersonal and communication skills to provide guidance and direction to local counterparts and communicate data, outcomes of findings, etc.
- f. Fluency in written and spoken English is essential;
- g. Ability to mobilize at short notice.

#### **6. LEVEL OF EFFORT AND DURATION OF ASSIGNMENT**

6.1 It is anticipated that the Consultant will commence as soon as possible until October 2022, on a Task Order basis. Work inputs are expected to be approximately 60 person days per assignment and will vary according to project requirements; hence there is no guarantee on the actual level of effort to be used for the duration of the contract.

6.2 Each mission will include preparatory work, training delivery and subsequent reporting. The duration could vary depending on country to be visited and agreed scope of work with the countries.

6.3 Flexibility on the part of the Consultant will be required to support program implementation, particularly during periods of heavy workloads, or when travelling for PREP requirements where full-time inputs may be required for short periods of time.

6.4 Work inputs and any travel will be agreed between the Consultant, and PREP Project Manager through issuance of individual Task Order, i.e. an order for the performance of a particular task/ assignment as required by PREP.

6.5 An Indefinite Delivery Contract will be signed in which both parties will agree on a unit daily fee rate fixed for the duration of the contract.

## **7. REPORTING REQUIREMENTS**

The consultant will report to Mr. George Beck, Programme Manager, Pacific Resilience Programme, [georgeb@spc.int](mailto:georgeb@spc.int) Pacific Community, Geoscience Energy and Maritime Division, Mead Road, Suva, Fiji. The consultant will also report to the Head of the technical agency responsible for earthquake and tsunami detection and warnings in country visited.

## **8. TRAVEL AND LOGISTICS**

All travel costs will be covered under a separate PREP budget line. SPC travel policy will apply for all travel.

## **9. CLIENT SUPPORT**

SPC will provide the necessary logistics support for the consultant including travel arrangements for deployment to the countries. SPC will also liaise with technical agencies in countries to facilitate meetings including protocol obligations with the Ministry/Department of Foreign Affairs.