ANNEX B- CONTINGENCY PLANS FOR SPECIFIC HAZARDS

ANNEX B.3.08- *Tsunamis*

I. VENUES AT RISK

The designation ***venue at risk*** is given to those installations associated with the XXI Central American and Caribbean Sports Games that are located in ***low-lying coastal areas susceptible to the tsunami hazard***, and also to any other place where persons associated with the Games may gather that is located in such low-lying areas. The ***low-lying coastal areas susceptible to the tsunami hazard*** have been identified and delimited in studies performed by the ***Puerto Rico Seismic Network*** and detailed information about the same, as well as location maps, accompany this Annex.

On the basis of that information, the following venues associated with the Games are designated ***venues at risk for tsunamis***:

OPERATIONS CENTER
CENTRAL AMERICAN STADIUM
ISIDORO GARCIA STADIUM
"PARQUE DEL LITORAL" (COASTLINE PARK)
HANDBALL PAVILLION AT EL MANI
…

The preceding list is not exhaustive and if any activity connected with the Games is scheduled to take place at an area close to the coastline it will be necessary to consult the provided maps to determine if the facility should be considered as a ***venue at risk for tsunami.*** A copy of this Annex should be included in the Plans binder for each installation included in the list.

Also, as pointed out below, some access routes to installations are susceptible to ***tsunamis*** and that fact will have to be taken into account.

II. DEFINITION OF THE *TSUNAMI* HAZARD

This Annex adopts the definition of the ***tsunami*** hazard that appears in the **Plan on *Tsunami* Warning and Evacuation for the City of Mayagüez**, developed by the Municipal Office of Emergency Management and Disaster Administration of the City of Mayagüez (in Spanish, Oficina Municipal de Manejo de Emergencias y Administración de Desastres, or OMMEAD). As indicated below, certain provisions of the said plan are applicable to response to ***tsunami*** hazard in connection with the Games, to the extent that they supplement and do not conflict with the provisions of this Annex.

The word ***tsunami*** is a Japanese word that means "port wave" or "hidden wave". A ***tsunami*** is a series of waves caused by a disturbance in the ocean that displaces a a great quantity of water. This disturbance is mostly associated with earthquakes in the oceanic or coastal areas. Landslides, volcanic eruptions, nuclear explosions and impact from outer space objects, such as meteors, asteroids or comets could also create ***tsunamis.***

The waves from a ***tsunami*** contain hundreds of times as much energy as that of a wind-generated wave. The same can affect a coastal zone for a period ranging from tens of minutes to several hours. The first wave is not always the most dangerous and it has been observed that

subsequent waves may cause more damages than the first. Some relevant facts are:

- Wind-generated waves usually are separated by intervals of five to twenty seconds. The length of a wind-wave averages between three hundred and six hundred feet.

- In the case of a ***tsunami*** wave the frequency interval may be from 10 minutes to two hours. The length of a ***tsunami*** wave may exceed three hundred miles.

- ***Tsunamis*** travel over land very rapidly, as a wall of water. From the coast, a ***tsunami*** may look like a wave that grows and diminishes rapidly or as a series of breaking waves.

- The strong currents and the debris transported by the wave contribute to the destructive nature of the floods.
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- ***Tsunamis*** are extremely deadly and can cause the loss of tens of thousands of lives, as was the case with the ***tsunami*** that hit the Indian Ocean in the year 2004. On October 11, 1918, there was a strong earthquake (M 7.3) in the Mona Canyon, to the Northwest of Aguadilla, which resulted in a ***tsunami*** that affected virtually all of the West Coast of Puerto Rico. The highest wave reached 20 feet and flooded 30 miles of coastline, resulting in at least 40 deaths, over 75 injured and damages to buildings and other property.

III. DETECTION OF THE *TSUNAMI* HAZARD

A. Modes of detection of *tsunami* hazard

There are two basic modes of detection of the ***tsunami*** hazard:

- Detection of "***tsunamigenic conditions***", that is, of events that could trigger a ***tsunami***, even if it has not materialized yet.
- Detection of a ***tsunami*** in progress.

Due to the severity of the risk and the very limited reaction time that could be available, it is provided that this Contingency Annex will have to be activated, as provided hereinafter, upon the mere detection of "***tsunamigenic conditions***", without waiting for confirmation of a ***tsunami*** in progress.

B. Responsibility for detection of hazards within the Games' organization.

The responsibility for identifying a ***tsunami*** hazard within the Games' organization resides in the ***Security and Emergency Management Committee*** (in Spanish, ***Comité de Seguridad y Manejo de Emergencias, CSME***) and, more specifically, in the ***Risks Analysis Unit of the Intelligence and Investigations Section*** of the ***General Staff*** of the ***Incident Commander*** for the Games. This unit will be active 24-hours-a-day during the Games.

For all of Puerto Rico, in general, the detection and notification of the ***tsunami*** hazard is assigned to the following entities:

- ***Puerto Rico Seismic Network (PRSN)***, located at the Mayaguez Campus of the University of Puerto Rico, which operates 24-hours-a-day and will have direct communication links with ***the Risks Analysis Unit of the Intelligence and Investigations Section of the CSME***.

- ***West Coast & Alaska Tsunami Warning Center -WCATWC)-*** This specialized center, located in the State of Alaska, has the responsibility of detecting ***tsunami*** hazards for Puerto Rico.

- ***Pacific Tsunami Warming Center*** - Provides backup services for the WCATWC.

- ***National Weather Service (NWS)***, whose San Juan Forecasts Office operates 24-hours-a-day. The NWS has assigned a staffer who will be ordinarily present at the facilities of the ***Risks Analysis Unit of the Intelligence and Investigations Section of the CSME***. In the absence of that local representative of the NWS, the ***Risks Analysis Unit of the Intelligence and Investigations Section of the CSME*** will maintain constant communication with the said NWS office, utilizing resources identified elsewhere.

C. Means of Detection of the Hazard

The ***tsunami*** hazard can be detected in several ways:

Local Detection

- If an earthquake with ***tsunamigenic*** potential is felt locally

- If the approach to the coast of a ***tsunami*** wave is observed, indicating a ***tsunami*** in progress.

- If significant changes in the sea level are observed, such as the retreat of the waters or an abnormal drop in the tides.

Any officer related to the Games who locally detects this hazard should notify the CSME immediately. This duty extends to personnel of the Public Safety and Emergency Management agencies assigned to the Games.

If the message is received by the Public Safety and Emergency Management agencies by any other means, they should immediately transmit the information to the CSME. For instance, if a State Police officer

not assigned to the Games detects locally a ***tsunami*** in progress, he should notify his agency immediately and it must in turn transmit the information immediately to the CSME.

Scientific Detection

A ***tsunami*** can be triggered by situations occurring far from the local area, without any immediate signs of the phenomenon that would permit local detection. However, there are scientific means for the prompt detection of the potential risk, before it materializes locally:

- Instruments operated by the ***PRSN***, located at the Mayagüez Campus of the UPR, provide several means of detection of ***tsunamis***.

- The ***West Coast & Alaska Tsunami Warning Center - WCATWC)*** also has scientific instruments that can detect a ***tsunami*** hazard.

- The ***Pacific Tsunami Warning Center*** provides backup services to the WCATWC.

Other Means of Detection

- The detection of a ***tsunami*** in progress at other locations in the Caribbean Sea and the Atlantic Ocean can result in reports from foreign official sources, the Press or any other source. These could include reports coming from other islands as well as from ships and airplanes. These reports could be received directly by those responsible for detection of risks at the CSME and should be corroborated promptly with the PRSN, as indicated below.

- Local private citizens or Media agencies could receive that information and informally communicate it to persons related

with the Games. It is required that any person related with the Games that receives from any non-official source information on a ***tsunami*** should communicate it promptly to the CSME.

D. Internal Tasks upon Detection of a *Tsunami* Hazard

When a ***tsunami*** hazard is detected by any means, the ***Risks Analysis Unit of the Intelligence and Investigations Section of the CSME*** shall establish immediate communication with the PRSN and/or the NWS to confirm the existence of the risk and determine the bulletins that it should generate.

IV. ISSUANCE OF ALERTS AND WARNINGS

A. Types of Official Bulletins for Puerto Rico

The principal types of bulletins issued by the authorities to alert about a ***tsunami*** in Puerto Rico are the following:

- ***Tsunami Warning*** ("***Aviso de Tsunami***") –bulletin issued by the ***Puerto Rico Seismic Network (PRSN)*** and/or the ***West Coast & Alaska Tsunami Warning Center (WCATWC),*** in coordination with the ***National Weather Service (NWS)*** and the ***Puerto Rico Emergency Management Agency (PREMA)***. A ***Tsunami Warning*** is issued when a potential ***tsunami*** with significant widespread inundation is imminent or expected. Warnings alert the public that widespread, dangerous coastal flooding accompanied by powerful currents is possible and may continue for several hours after arrival of the initial wave. Warnings also alert emergency management officials to take action for the entire ***tsunami*** hazard zone. Appropriate actions to be taken by local officials may include the evacuation of low-lying coastal areas, and the repositioning of ships to deep waters when there is time to safely do so. Warnings

may be updated, adjusted geographically, downgraded, or canceled. To provide the earliest possible alert, initial warnings are normally based only on seismic information.

- ***Tsunami* Advisory** - bulletin issued by the ***Puerto Rico Seismic Network (PRSN)*** and/or the ***West Coast & Alaska Tsunami Warning Center (WCATWC),*** in coordination with the ***National Weather Service (NWS)*** and the ***Puerto Rico Emergency Management Agency (PREMA)***, indicating that there is the potential that a ***tsunami*** may reach the alerted area within two hours. The ***Tsunami Advisory*** is issued due to the threat of a potential ***tsunami*** which may produce strong currents or waves dangerous to those in or near the water. Coastal regions historically prone to damage due to strong currents induced by ***tsunamis*** are at the greatest risk. The threat may continue for several hours after the arrival of the initial wave, but significant widespread inundation is not expected for areas under an advisory. Appropriate actions to be taken by local officials may include closing beaches, evacuating harbors and marinas, and the repositioning of ships to deep waters when there is time to safely do so. Advisories are normally updated to continue the advisory, expand/contract affected areas, upgrade to a warning, or cancel the advisory.

- ***Tsunami Watch ("Vigilancia de Tsunami")*** - bulletin issued by the ***Puerto Rico Seismic Network (PRSN)*** and/or the ***West Coast & Alaska Tsunami Warning Center (WCATWC)***, in coordination with the ***National Weather Service (NWS)*** and the ***Puerto Rico Emergency Management Agency (PREMA)***, indicating the occurrence of a remote seismic event and alerting of the possibility of generation of a transoceanic ***tsunami***. A ***Tsunami watch*** is issued to alert emergency management officials and the public of an event which may later impact the watch area. The watch may be upgraded to a warning or advisory - or canceled - based on updated information and analysis. Therefore, emergency management officials and the public should prepare to take action.

Watches are normally issued based on seismic information without confirmation that a destructive ***tsunami*** is underway.

- ***Tsunami Information Statement ("Boletín Informativo de Tsunami")***- a ***tsunami*** information statement is issued to inform emergency management officials and the public that an earthquake has occurred, or that a ***tsunami*** warning, watch or advisory has been issued for another section of the ocean. In most cases, information statements are issued to indicate there is no threat of a destructive ***tsunami*** and to prevent unnecessary evacuations as the earthquake may have been felt in coastal areas. An information statement may, in appropriate situations, caution about the possibility of destructive local ***tsunamis***. Information statements may be re-issued with additional information, though normally these messages are not updated. However, a watch, advisory or warning may be issued for the area, if necessary, after analysis and/or updated information becomes available

- ***Bulletins issued by municipal governments according to their Plans on Tsunami Warning***- Several municipalities in which events associated with the Games will take place have plans for ***Tsunami Warning*** and may generate communications or issue official advisories in compliance with the same.

- ***Bulletins issued by the Puerto Rico Emergency Management Agency (PREMA)- PREMA*** may generate communications to alert about a ***tsunami*** hazard even before the previously listed official bulletins are issued.

B. Responsibility for the Issuance of Internal Bulletins

The ***Risks Analysis Unit of the Intelligence and Investigations Section of the CSME*** is responsible for continuous attention to means of

communication and transmission of information through which the official bulletins listed above may be received.

Every time when any of the above listed bulletins is issued, the ***Risks Analysis Unit of the Intelligence and Investigations Section of the CSME*** must activate immediately its Protocol for Notification of Internal Emergency Advisories, and should verify that the information has been received by the corresponding officers.

V. REQUIRED MEASURES UPON ISSUANCE OF ALERTS OR WARNING OR UPON LOCAL DETECTION OF A TSUNAMI HAZARD, BEFORE THE TSUNAMI ARRIVES.

A. Interruption of activities- Due to the grave danger to lives and properties that exists during a ***tsunami*** event, it is expressly established that the interruption of activities, including sports events, must be ordered immediately if official alerts or warnings are issued or if the ***tsunami*** hazard is detected locally.

The Games' Director of Security has the authority to order interruption of all activities, including sports events. This authority is delegated to the highest-ranking officer ascribed to the CSME who is in charge of operations at any installation, and the said officer will also have the authority to order the interruption if official alerts or warnings are issued or a ***tsunami*** hazard is detected locally.

Ordinarily this responsibility will belong to the highest-ranking officer of the ***Preventive Watch Group of the Public Safety Sub-branch of Branch 3 (Emergency Services)*** present at the installation.

B. Preventive Evacuation

At any installation that is considered a ***venue at risk of tsunami,*** at least one unit of the ***Evacuation Group of the Emergency Services Sub-branch of Branch 3 (Emergency Services)*** must be present at all times when activities are under way. The said unit will be prepared to act immediately, according to its protocol.

If the ***tsunami*** has still not materialized and it is possible to implement the evacuation of the installations subject to the risk without endangering the persons, the preventive evacuation of the installation must be executed immediately.

When it is not possible to conduct the evacuation without endangering persons, all of those present must be instructed to move to the highest and safest available location within the installation.

Ordinarily the responsibility of directing preventive evacuation will belong to the ***Evacuation Group of the Emergency Services Sub-branch of Branch 3 (Emergency Services)*** present at the installation.

Evacuation affects two categories of persons:

- **Category 1**: Persons officially related with the Games, including athletes, officers and other members of delegations, judges, officials and employees of the Organizing Committee and the ODECABE.

- **Category 2:** Public attending the activities

The CSME's responsibilities regarding these two types of persons are different. In the case of **Category 1**, as indicated forthwith once the evacuation is completed the ***CSME*** will be responsible for directing the transfer of the said persons to safe areas. In **Category 2**, that responsibility corresponds to the local authorities (State and municipal), according to their own plans.

C. Preventive Transfer to Safe Areas

At any installation identified as **venue at risk for tsunami** adequate means of transportation should be available for immediate activation to provide for preventive transfer to safe area of all **Category 1** persons present at the time of the evacuation. If the condition and the available time permit it, these means of transportation should be used to transfer members of **Category 1**. If it were not possible, safe or advisable to make the transfer in vehicles, the persons should be led, walking under adequate escort. For each facility a **safe area** to which the transfer should be made has been designated.

In any case in which a preventive transfer to safe areas is being effected, measures must be taken to assure fast movement to these areas, closing to regular traffic the roads to be employed and providing adequate escort to any vehicles that transport **Category 1** persons.

Ordinarily, the responsibility of handling the transfer to safe areas will correspond to the regular transportation resources of the ***Games' Organizing Committee*** and will be directed by the highest-ranking officer of the ***Escort and Traffic Group of the Public Safety Sub-branch of Branch 3 (Emergency Services)*** present at the installation.

However, under certain circumstances it may be necessary to provide additional means of transportation or heavy vehicles. In that case, the ***Transportation of Persons Group of the Transportation Sub-branch of Branch 4 (Support Services)*** will be activated.

D. Attention of Category 1 members transferred preventively to safe areas

Whenever an evacuation is effected and members of **Category 1** are transferred to a safe area, resources needed to care for these persons until the situation returns to normal will be activated.

The responsibility of caring for the needs of members of **Category 1** that have been transferred preventively to safe areas belongs to the ***Lodging and Shelters Group and the Food Services Group of the Field Services Sub-branch of Branch 2 (Human Needs).***

Simultaneously, verification that all members of **Category 1** have been located and are safe must be performed. This responsibility belongs to the ***Center for Attention to Victims of the Specialized Centers Sub-branch of Branch 2 (Human Services).***

E. Continuity of Essential Operations

Whenever an installation is preventively evacuated due to a ***tsunami*** hazard, measures will be taken to provide for the continuity of essential operations that are ordinarily performed at that installation. Work plans at every installation will contain provisions to that end. That is the specific case of the Operations Center, located in a ***tsunami*** hazard area, which counts with protocols to transfer all essential operations to alternate facilities.

The responsibility of setting-up alternate facilities is shared by the directors of the affected facilities and the ***Support to Installations and Technical Services Group of the Support Services Sub-branch of Branch 4 (Support Operations).***

VI. REQUIRED MEASURES AFTER A TSUNAMI

A. Threats Associated to a *Tsunami*

The occurrence of a ***tsunami*** will cause some dangerous situations and some particular complications that could prevent the execution of the measures described in the preceding **SECTION V**. Among the special risks after a ***tsunami*** hits are:

- Entrance to the area of huge volumes of water that move at fast speeds and can drag away persons and properties and destroy facilities.
- Residual flooding once the wave(s) from the ***tsunami*** are over
- Obstruction by debris or structural damages to public roads and bridges along the transfer routes for Category 1 members.
- Collapse of structures
- Failure of essential services, including electricity, water, etc.

B. Required Special Measures

As a rule, if a ***tsunami*** occurs without it being possible to perform all of the preventive measures directed in the preceding **SECTION V**, an attempt will be made to keep performing those measures in the safest possible manner, but with the following exceptions:

- Immediately after a facility is affected by a ***tsunami***, any ongoing activities, including sports events, should be interrupted.

Ordinarily this responsibility will belong to the highest-ranking officer of the ***Preventive Watch Group of the Public Safety Sub-branch of Branch 3 (Emergency Services)*** present at the installation.

- If the ***tsunami*** affects a facility where members of **Category 1** are present, the first response must include trying to concentrate these persons at the highest possible and safest place within the same installation. Emergency loudspeakers must be used to issue these instructions if the conventional sound systems have failed.

- Before attempting to evacuate a facility already affected by a ***tsunami***, verification must be made to the effect that movement of persons away from the installation will not expose them to undue risks.

The responsibility of directing post-***tsunami*** evacuation will belong to the ***Evacuation Group of the Emergency Services Sub-branch of Branch 3 (Emergency Services)***, with support from the ***Emergency Management Group of the Emergency Services Sub-branch of Branch 3 (Emergency Services)***

- After a ***tsunami*** occurs, it will be necessary to wait for the "all clear" bulletin issued by the pertinent authorities before attempting the transfer to safe areas, and verification must be made of availability of safe routes, and of adequate vehicles to perform the transfer. A surveillance of the designated routes and the clearing of light debris may be necessary.

Ordinarily, the responsibility of handling the transfer to safe areas will correspond to the regular transportation resources of the ***Games' Organizing Committee*** and will be directed by the highest-ranking officer of the ***Escort and Traffic Group of the Public Safety Sub-branch of Branch 3 (Emergency Services)*** present at the installation.

However, under certain circumstances it may be necessary to provide additional means of transportation or heavy vehicles. In that case, ***the Transportation of Persons Group of the Transportation Sub-branch of Branch 4 (Support Services) will be activated.***

The responsibility of directing the first ***post-tsunami*** clearing of the routes to be employed to transfer members of **Category 1** will correspond to the ***First Response Group of the Public Works and Engineering Sub-branch of Branch 1 (Infrastructure).***

As soon as possible, particularly if an installation has been affected by flooding or by total or partial collapse of structures, a careful inspection will have to be made to detect live persons who are injured or trapped, find corpses, etc.

The duty to perform the first inspection of any affected installation is assigned to the ***Preventive Watch Group of the Public Safety sub-branch of Branch 3 (Emergency Services)***.with support from members of the ***Evacuation Group of the Public Safety Sub-branch of Branch 3 (Emergency Services)***.

If a search reveals that there are injured, trapped or dead victims, immediate support from the following groups must be mobilized:

-***Medical Emergencies Group of the Emergency Services Sub-branch of Branch 3 (Emergency Services).***
-Search and Rescue Group of the Emergency Services Sub-branch of Branch 3 (Emergency Services).
-Fatalities Handling Group of the Field Services Sub-Branch of Branch 2 (Human Needs).

- As soon as possible a complete verification of the status and location of all **Category 1** persons must be conducted.

> This responsibility will be assigned to the ***Center for Attention of Victims of the Specialized Centers Sub-branch of Branch 2 (Human Needs).***

- Whenever, after a ***tsunami***, persons belonging to **Category 1** are transferred to safe areas, specific resources will be mobilized to provide the special care that they may require until the situation returns to normal.

> The responsibility of caring for the needs of members of **Category 1** that have been transferred preventively to safe areas belongs to the ***Lodging and Shelters Group*** and the ***Food Services Group of the Field Services Sub-branch of Branch 2 (Human Needs).***

- Regarding persons of **Category 2** (spectators, area residents, etc.) their attention will be assigned to municipal and State authorities under the terms of their own operational plans, once they are removed from the affected facility.

- Whenever a ***tsunami*** occurs and certain critical facilities are affected, special measures shall be taken to assure the continuity of essential operations that are regularly performed at the said facilities.

That is the specific case of the ***Operations Center***, located in a ***tsunami*** hazard area, which counts with protocols to transfer all essential operations to alternate facilities.

The responsibility of setting-up alternate facilities is shared by the directors of the affected facilities and the ***Support to Installations and Technical Services Group of the Support Services Sub-branch of Branch 4 (Support Operations).***

- After a tsunami occurs, there will be an immediate effort to verify damages to the communications networks operated by the CSME and any required alternate means of communication will be activated.

The responsibility of setting-up alternate communications network corresponds to the ***Communications Group of the Support Services Sub-branch of Branch 4 (Support Operations).***

VII. NORMALIZATION

The normalization of operations at the earliest possible moment is a central objective of this Annex. Two different scenarios are contemplated:

- That the anticipated ***tsunami*** has not occurred, in which case when the ***Puerto Rico Seismic Network*** or the ***West Coast & Alaska Tsunami Warning Center*** indicate that the danger is over, all alerts will be cancelled and efforts will be made towards a rapid normalization of activities.

- That the **tsunami** has actually occurred, in which case numerous measures will have to be taken as part of the normalization and recuperation process. The said measures are discussed in the following section.
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VIII. RECUPERATION

It is foreseeable that if a ***tsunami*** affects severely the geographic region where the Games will be held it will be necessary to take numerous actions conductive to recuperation. In that case, all of the ***Operational Groups*** of all of the ***Branches*** will be activated to ascertain the impact and to organize the recuperation operations.

A. Impact Analysis

In order to make a precise analysis of the impact of a ***tsunami***, it is essential that every individual impact be turned into a "complaint" ("querella") within a mechanized registry of impacts. The duty of creating such a registry corresponds to the ***Impact Analysis Unit of the Intelligence and Investigations Section of the CSME*** and in the performance of this task several tools such as the ***"UAI" system*** of incident reports operated by **PREMA** will be employed.

B. Recuperation Operations

The recuperation operations will involve State and Municipal resources that had not been previously assigned to the Games. It is to be expected that several State, Municipal and Federal plans may be simultaneously activated and the CSME will establish coordination with the respective authorities.

The resources of the different operational groups assigned to the CSME will be employed under its direction to collect

information and to take all measures that can be performed with their organic resources and with additional resources.

Among those activities, it is necessary to highlight the inspection of all structures associated with the Games to determine if they are safe or if there are hazards that must be corrected before they can be used again.

The responsibility of inspecting the facilities will be shared between the directors of the affected facilities and the ***Structural Damages Group of the Public Works and Engineering Sub-branch of Branch 1 (Infrastructure).***