Interspill 2022 – Call for Papers – *Extended Abstract (500-1000 words)*

Topic: Offshore

Paper title: Response guidelines for planning of offshore and costal response in challenging waters – Brazilian Equatorial Margin – A study case

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Abstract:

Due to the exploratory activities in the region called Equatorial Margin, which comprises the North Coast of Brazil, Guyana, Suriname, French Guyana, Venezuela and Caribbean Sea nations, Petrobras has expanded its response capability in case of an oil spill. Among the main challenges for the response activities are: i) offshore and nearshore presence of reefs; ii) strong currents (above 5kt) and tidal ranges (up to 8m); iii) extensive continuous mangrove fringes (up to 2.700km); iv) possibility of a large spill to reach several countries in South America and Caribe.

To cope with environmental sensitivities, the Company has proposed a distinct response structure. A fleet of oil spill response vessels equipped with advance detection and active containment capability is predicted to provide initial response. Due to poor logistical conditions and remoteness of the area, there is a low availability of vessels of opportunity. Therefore, all the supply ships mobilized to support the drilling campaign will have response equipment. Considering the encounter rate concept and NOFI Current Buster 06 features, this first response layer has an estimated capability of 230 m3 of recovered oil per day per vessel or 1.140 m3/day for the entire fleet.

Because local meteoceanographic conditions can be harsh for the containment and recovery technique, aerial chemical dispersion is predicted to be available through an aircraft to be locally stationed in a 02-hour-flight radius from the blocks. This second response layer offers a capability of treating 1.000-1.600 m3 of oil per day, depending on the aircraft used. Due to the extensive presence of reefs at sea, as observed by Moura et al. (2016), and mangroves at the coastline, the adoption of SIMA to support the decision-making process is technically mandatory, although not expressed required in Brazilian environmental regulations. For this reason, a preliminary assessment has been performed, with an intensive compilation of data aimed at providing an initial evaluation of toxicological concerns and general impacts on the local ecosystems. Complementary surface and subsea modelling were developed for reference conditions and scenarios, thus allowing the identification of key parameters of concern for the use of dispersants.

Additionally, four Environmental Defense Centers (CDA, in Portuguese), with specialized equipment and personal will be established in the region. To allow for a quick answer in protecting the marine hotspots of Banco do Alvaro, Banco do Tirol e Parcel Manuel Luis, a tier 01 base will be stablished in the nearest land point to these locations and with fishery and tourism vessels of opportunity kept under contract to allow response to occur before the oil can impact sea conservation units. Because harsh tidal and sea conditions can impair or difficult the mobilization of equipment through the estuaries' mouths, a key stockpile will be kept onboard at a dedicated supply vessel, which will fulfill the role of a floating staging area and will also

provide an additional storage capability. Because most vessels of opportunity usually operate with little temporary flotation storage capability, this multipurpose vessel can significantly reduce the downtime needed to navigate and offload the oily mixture recovered, thus playing a key role in the first hours of the response. Besides, most of the protective conventional boom is to be complemented with fast water containment systems.

Because road conditions are poor, especially during the rainy season, the other three CDA bases will be strategically placed to allow the aerial mobilization of response personnel from other regions of the country and of local communities that will integrate the effort, mainly in cleaning sand beaches. These facilities will contain thousands of meters of containment booms, dozens of skimmers and pumps and temporary storage tanks, plus big amounts of sorbent material. Not only, will also have specific nets designed to contain dense weathered oil and tar balls eventually detected in the water column.

Additionally, due to the region's high sensibility, wildlife response teams and material will be kept in strategical places, such as in the CDA, NGO's and universities' facilities and specific locations where temporary wildlife triage and stabilization installations can be set during the response. These teams will also execute preliminary monitoring of the wildlife in the region before a spill occurs.

Aiming at organizing the field data and allowing the response team to prioritize vulnerable areas, a SCAT routine was planned. This preliminary assessment divided the coastline in segments depending on morphological and ecological features, but also considered logistical restrains, especially for those accessed exclusively by water. In accordance with the best technical practices, different tiers for SCAT capabilities were considered: aerial (through fixed and mobile-wing aircrafts and drones), maritime (with large and small vessels) and by land (with offroad vehicles).

In case of the spill reaching international waters or other countries' territory, thus demanding the international mobilization of response personnel and equipment to act in these locations, a logistical plan was developed, and a logistical operator hired before the drilling activities began. Not only response resources from international entities, such as OSRL, ITOPF, ARPEL, MSRC, are to be mobilized, but also a significant share of the Brazilian CDA will be aerial transported and deployed as needed.

Finally, a proactive articulation and engagement program was developed, thus contacting national Governmental agencies from neighboring countries, such as Suriname, Guyana and French Guyana, and aiming at establishing cooperation protocols complementary to and more specific than the National Contingency Plans (NCP). These agreements can be decisive to facilitate logistical mobilizations and other aspects of the emergency management, such as the visa permits requirements, the hiring of local contractors and the consideration of local knowledge at the decision-making process.

This paper aims at providing insight for operators and environmental regulators of different countries which have similar complexities and environmental concerns.

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