

# **STATUS REPORT; SEME OIL FIELD WITH INSTALLATIONS AND CONNECTED ONSHORE FASILITIES.**

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## **REPUBLIC OF BENIN**

Benin is a Western African country bordering Niger and Burkina Faso in the north, Nigeria in the east and Togo in the west. Benin has over 120 km shoreline to the South Atlantic Ocean.

Benin is a coastal country with a population of 6.2 mill. Inhabitants. It stretches from north to south over a distance of 750 km. Total land area: 114,700sq km.

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Benin has a coastal sedimentary basin part witch stretches into the Atlantic Ocean. The Seme oil field was discovered in 1968, 13 km south from the shore. The development and production started in October 1982.

The Seme oil field covers an area of 63sq km, between latitude 6° and 11' to 17° North, longitude 2°, 40' to 43° east

The Seme oil ore are divided into two structures known as Seme North and Seme South. Located at about 2500m west of Benin/ Nigeria border.

## **HISTORY OF SEME OIL FIELD**

The company Union Oil of California discovered the Seme oil ore in 1968.

In 1979, the Norwegian company Saga Petroleum signed a service provision contract with the Benin government for development and production of Seme Oil Field. The project started in 1980 and production in October 1st. 1982.

Saga Petroleum Benin, have carried out the following works according to the framework of the contract implementation.

- 1980 installation of platform P1, P2, P3 and achieved an oil terminal
- 1981 the construction of storage tanks and pump station was completed
- 1982 the wells S1 and S2 where drilled.
- 1983 the wells S3, S4, S5 and SC1 where drilled
- 1984 the wells S6, S7 and SC2 where drilled
- 1985 the wells S8A and SC3 where drilled

Well S9 was drilled in 1988 by a company called ASHLAND which in May 1988, signed a contract with Benin, this company also manufactured monopods M1 and M2 in 1985 and installed them in 1989. ASHLAND drilled respectively wells S10, S11 and S3D in 1989, 1990 and 1991.

After more than sixteen years of exploitation (1982- 1998) and a production of about 22 mill. Barrels of crude oil of 22,7 degree API, the Seme oil field were closed on 31st December 1998 for economic reasons.

Since the closing of the oil field and up to date, the installations which were abandoned have not been maintained and remained in a state of worsening dilapidation due to lack of funding.

## DESCRIPTION OF THE INSTALLATIONS

They are composed of:

Offshore as installations, platforms, monopods, additional equipment, wells, submarine cables and integrated pipelines. Terminal equipment comprising of buoys and loading hoses. On shore storage tanks, pumping station and other equipment.

### Platform P1 and P2

Offshore installations composed of production platforms P1 and P2 (Tripod foundations) Both platforms are built in 1980 in Norway and classified by DNV until 1985. Since then classified by Lloyd's register



Platform P1

### Monopod M1 and M2

Offshore installations composed of monopods M1 and M2, both built in 1985 in Norway. Installed in 1989. Current classification: Lloyds register.



Monopod M1

### **Platform P3**

**No further information's regarding offshore installation and main production platform P3 (tetrapod foundation).**



**Platform P3**

### **PIPELINES BETWEEN OFFSHORE INSTALLATIONS AND ONSHORE STORAGE TANK**

**Pipeline between P1 – P3, 6", length: 2530m**

**Pipeline between P2 – P3, 6", length: 5900m**

**Pipeline between M1 – P3, 4", length 1000m**

**Pipeline between M2 – P3, 4", length: 750m**

**6" supply pipeline from P3 to onshore storage tank have a length of 13130m.**

**20" supply pipeline from storage tank and to offshore loading terminal, length: 7760m.**



**Tank T-700A**

## **ONSHORE STORAGE TANK FARM AND PUMP STATION**

Consisting of two large storage tanks, T-700 A and T-700 B. Through visual inspection both tanks seems to be in fairly good conditions, lifting roof on both tanks need some reparations. Pump station are in poor condition but, intact and due to long time without maintenance it will need main repair and service. The 20-inch pipeline contains 4000 barrels of crude oil, for preservation purpose.

Buildings on site are in decay and some of the roofs have caved in.



**View of floating roof on T-700B**

### **IDENTIFIED WORK SCOPE**

It is urgent to set down a fact-finding mission to give a cost estimation and to identify the work scope within each operation involved. Due to the unsecured wells and the conditions on the pipelines, valves and wellhead's it is only a matter of time before an environmental disaster can occur.

The installations have been frequently visited by fishermen and looters and leakage from wellhead and other installations have occurred due to this activity. Some of the integrated sub sea pipelines between installations are fractured and sporadic leaking oil.

Server corrosion and mechanical impact are visible on risers, pipe work and installations in general; sporadic leakage due to brittle sealing and gaskets and the impact of weather conditions and human activity create a situation of an environmental ticking bomb.

In 1989 the consulting firm GUSTAVSON ASSOCIATES conducted a feasibility study and gave a cost estimation and a proposal regarding securing and dismantling procedure of the installations. This study has later been updated. This study is available on request to the Benin authorities.

**THE SECURING OF WELLS AND DISMANTLING OF INSTALLATIONS REQUIRES SUBSTANTIAL INVESTMENT THAT THE NATIONAL BUDGET OF BENIN ARE NOT CAPABEL OF FUNDING.**

## **SECURING WELLS (PLUG & ABANDONING)**

Include cutting of well string, installing of new preventer and cementing the well before abandoning. Requires vessel with lifting equipment. After established structural integrity in the well (according to international well abandonment procedures), the well will be inactive and secured.

There are 11 wells that are unstable, S1, S2, S3, S4, S5, S6, S7, SC1, SC2, SC3, and S8A. I have at this moment no ranging to witch wells is most critical or if all are left without preventer.

Regarding respective wells drilled by ASHLAND, S9, S10, S11, and S3D; I have no further information and status.

## **DISMANTLING, PIGGING AND REMOVAL OF PIPELINES ETC.**

Requires pigging and hydro jetting of pipelines on installations and sub sea lines.

Radioactive and gas measurement (continuously)

Securing (plugging) and preservation of sub sea pipelines before removal from seabed.

Securing area surrounding, installations and work area against oil pollution due to hydro jetting and dismantling.

Visual sub sea inspection of all sub sea pipelines before pigging operations

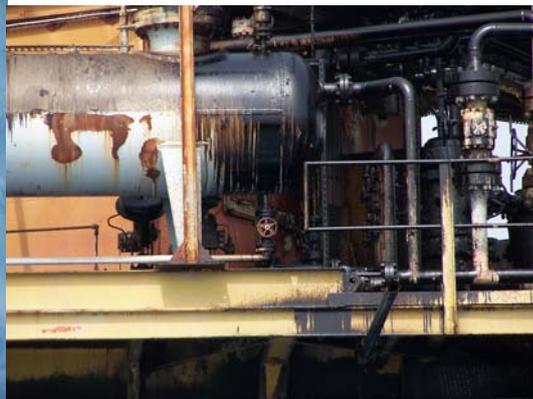
## **DISMANTLING OF INSTALLATIONS**

Consisting in removing platform deck, all casing, risers and pipe work connected to sub sea installations. Removal of monopods and tripods foundations.

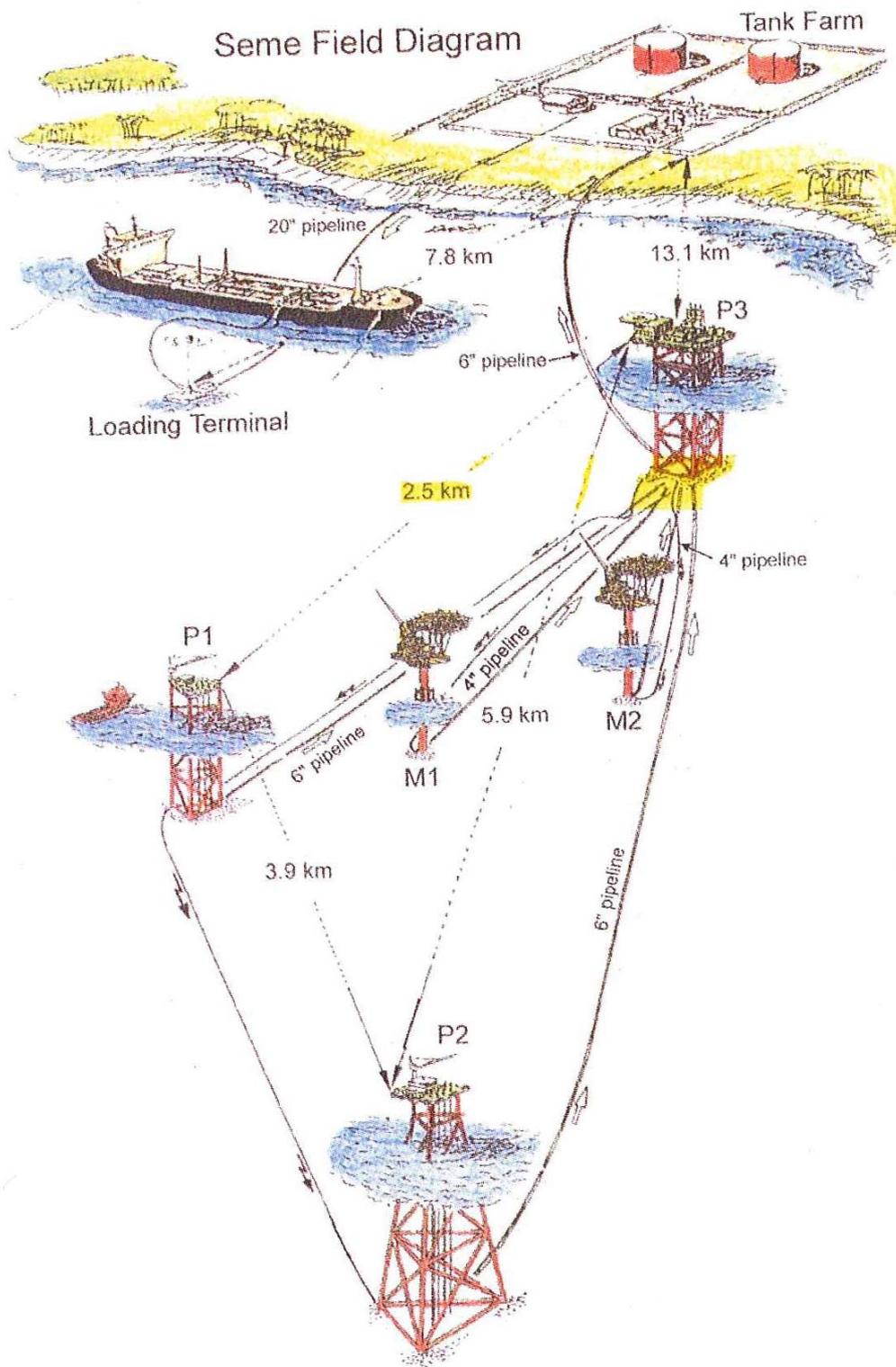
Disconnection and removal of all submarine cables.



**Oil pollution from M1**



**View of oil leakage on main deck P1**



## **ENVIRONMENTAL IMPACT**

The Guinea gulf is one of West Africa richest fishing grounds and the main source of economical income for most of the coastal settlements.

Major oil pollution from the Seme oil field would create a regional disaster of greater proportion. Due to the route of the sea current most of the coastline from north of Nigeria and westward to Ghana could be affected.

As mentioned earlier there are a constant threat from undesirable visitors and looters as gas leakage and removal of equipment could lead to pressure release and, or ignition.

The area is within the regular shipping routes of international commercial traffic. Due to the risk of a collision, installations are installed with lanterns and signal lamps that are powered from mainland.

Local fishing vessels are trawling between the installations and are a constant threat to damaging the sub sea pipelines and cables.

## **OIL SPILL PREPERDNESS**

It is highly recommended that there are taken precautions toward oil spill accident and that there are oil booms ( 2-3000m) and oil spill equipment stored onshore.

This should contain suction pumps, hoses and portable tanks for oil spill. Personal safety equipment containing, gasmask, chemical resistant suits, gas-metering instruments etc. Training and drilling of personnel.

### **Sources:**

Referendum on Seme oil field facilities, Cotonou 3, march 2009, by ATCHADE JACQUES JEAN  
Etude de l'impact environnemental du demantelement des installations du Champ Petrolifere de Seme  
All photo by Ingolf Andersen