

INTECNA srl

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E mail intecna@libero.it

HYDRO-TESTING PROCEDURES

REFERENCES LIST AND APPROVALS

Case History n° 1
Year : 1996



COMPANY : **CHEVRON NIGERIA LIMITED**
 CONTRACTOR : **SAIPEM SPA - ABB LUMMUS CREST**
 PROJECT : **ESCRAVOS**
 COUNTRY : **NIGERIA**
 PIPELINE : **ON / OFFSHORE**
 DIAMETER : **20" - 18" - 16" - 8"**
 WATER TO BE TREATED : **RIVER WATER**
 QUANTITY : **11,000 CUBIC METER**
 CORROSION INHIBITOR : **HYCOR FA**
 OXYGEN SCAVENGER : **HYCOR OX 65**
 BIOCIDES : **HYCOR AK**

ENVIRONMENTAL COMPATIBILITY : **COMPLETE**
 APPROVED BY : **ATLANTIC WASTE MANAGEMENT LTD**
ENVIRONM. DPT

MINISTRY OF PETROLEUM AND MINERAL RESOURCES

PETROLEUM RESOURCES DEPARTMENT
 44 ERIC MOORE ROAD, SURULERE, LAGOS.

P. M. B. No. 12650
 Telegrams
 Telephone
 Telex 27478 NG



Ref No. P/ITC/6213 Vol.1/1
 Date 21st February, 1996

The Managing Director,
 SAIPEM CONTRACTING NIG. LTD.,
 Plot 99 Ajose Adegun Street,
 P. O. Box 7289,
 Victoria Island,
 Lagos.

ATTENTION: MR. P. GALLO

Dear Sir,

RE: APPLICATION FOR DISCHARGE PERMIT FOR CORROSION INHIBITORS HYCOR FA, HYCOR OX 65, HYCOR AK

I am directed to acknowledge receipt of your application Ref: SW/GIL/014 of 14th February, 1996 on the above subject matter together with the toxicity test report on the chemicals in question, and to inform you that approval has been granted for you to discharge the treated hydrotest water into the Escravos River Estuary area and at offshore into the sea.

2. However, the discharge into the Escravos River Estuary area must be controlled and timed to coincide with the period prior to commencement of ebb tide when sufficient dilution of at least a thousand fold would be provided by the recipient water. Also, officials of this Department (or the Director or at the Escravos Terminal must witness the discharge of the treated water.

Yours faithfully,

[Signature]
 DR. J. N. NWANKWO
 for Director of Petroleum Resources.

Mr. Dir.		
Mr. Asst. Dir.		
Mr. Secy.		
Mr. Asst. Secy.		
Mr. Asst. Dir. (Adm.)		
Mr. Asst. Dir. (Tech.)		
Mr. Asst. Dir. (Environm.)		
Mr. Asst. Dir. (Legal)		
Mr. Asst. Dir. (Finance)		
Mr. Asst. Dir. (Gen. Serv.)		
Mr. Asst. Dir. (H.Q.)		
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Case History n° 2
Year : 1996

COMPANY	: ENEL
CONTRACTOR	: SAIPEM SPA
PROJECT	: MONTALTO DI CASTRO
COUNTRY	: ITALY
PIPELINE	: ON
DIAMETER	: 16"
WATER TO BE TREATED	: RIVER WATER
QUANTITY	: 10,000 CUBIC METER
CORROSION INHIBITOR	: HYCOR SC
ENVIRONMENTAL COMPATIBILITY	COMPLETE
APPROVED BY	: ENEL / ENVIRONM. DPT

Case History n° 4
Year : 1997

COMPANY : **SAIPEM SPA**
CONTRACTOR : SAIPEM SPA
PROJECT : BONACCIA GAS FIELD DEVELOP.
COUNTRY : ITALY
PIPELINE : OFFSHORE
DIAMETER : JACKET
WATER TO BE TREATED : SEA WATER
QUANTITY : 2,000 CUBIC METER
CORROSION INHIBITOR : HYCOR EX 50
BIOCIDE : HYCOR SB

ENVIRONMENTAL COMPATIBILITY : COMPLETE
APPROVED BY : SAIPEM SPA
ENVIRONM. DPT

Case History n° 5
Year : 1997

COMPANY : **DABHOL POWER - INDIA**
CONTRACTOR : BECHTEL
PROJECT : DABHOL POWER PROJECT
COUNTRY : INDIA
PIPELINE : ON / OFFSHORE
DIAMETER : 24" - 16"
WATER TO BE TREATED : SEA WATER
QUANTITY : 1500 CUBIC METER
CORROSION INHIBITOR : HYCOR FA
OXYGEN SCAVENGER : HYCOR OX 65
BIOCIDE : HYCOR AK

ENVIRONMENTAL COMPATIBILITY : COMPLETE
APPROVED BY : BECHTEL/DABHOL POWER CO
ENVIRONM. DPT

INTECNA srl
0094 PESCHIERA BORMINO (MI)
Via Po, 10 - 20139 MILANO, Italia
Tel. 02/58114714
Fax 02/58114715
SEA 18038 - SE 2044-06



DABHOL POWER PROJECT

HYDROTESTING WATER TREATMENT

UNCONTROLLED COPY

COMPANY : DABHOL POWER CO.
CONTRACTOR : BECHTEL
SUBCONTRACTOR : SAIPEM SPA

22-544-1-VCPCG-023-0017/02

Rev. 1 - 27-11-1997

Case History n° 7
Year : 1997




COMPANY	: PETROLEUM DEVELOPMENT OMAN
CONTRACTOR	: SAIPEM -CCC JOINT VENTURE
PROJECT	: LNG UPSTREAM GAS SUPPLY
COUNTRY	: OMAN
PIPELINE	: ON SHORE
DIAMETER	: 48"
WATER TO BE TREATED	: SEA WATER
QUANTITY	: > 430,000 CUBIC METER
CORROSION INHIBITOR	: HYCOR FA
OXYGEN SCAVENGER	: HYCOR OX 65
BIOCIDE	:
ENVIRONMENTAL COMPATIBILITY	: COMPLETE
APPROVED BY	: ENVIRONM. DPT



شركة تنمية نفط عمان ش.م.م
Petroleum Development Oman L.L.C.

P.O. Box 81, Postal Code 113 Muscat, Sultanate of Oman
 Tel: 2467 Fax: 24677106, 24675093
 P.O. Box 81, Postal Code 113 Muscat, Sultanate of Oman
 Tel: 2467 Fax: 24677106, 24675093

CERTIFICATE OF REGISTRATION - MATERIAL VENDOR	
Cert. No. 102237	Date of Issue: 28/01/2006
PETROLEUM DEVELOPMENT OMAN LLC	
CERTIFIES THAT:	
Manufacturer	: INTECNA SRL
Country of Origin	: ITALY
Local Representative/Agent	: MOHSIN HAIDER DARWISH LLC
Address	: P.O. BOX 880, PC 112 RUWI, SULTANATE OF OMAN
IS REGISTERED WITH THE COMPANY AS AN APPROVED MATERIAL VENDOR WITH EFFECT FROM THE DATE OF ISSUE OF THIS CERTIFICATE. FOR THE FOLLOWING MATERIAL GROUP CATEGORIES:	
PIPELINE PRODUCT	
AVME 8.1 - PRODUCTION CHEMICALS - SSI 89TAAA 12 - PRODUCTION CHEMICALS GENERAL	
 MAHMOUD AL LAWATIA - FPS HEAD BUSINESS DEVELOPMENT	
NB: This Certificate is valid until 31.12.2007 Please refer overleaf for details	

Incorporated in Oman by Royal Decree as a limited liability company
 Head Office: Mina al Fahal Commercial Registration No. 9999
 شركة تنمية النفط المسجلة كإحدى الشركات ذات المسؤولية المحدودة بموجب مرسوم سلطاني
 المكتب الرئيسي: ميناء الفحل رقم السجل التجاري ٩٩٩٩

Case History n° 8 (BLUE STREAM) Year : 2000



Blue Stream is one of the most significant projects in the international gas sector, both from a strategic and from a technological point of view. The project involved the construction of a system to transport natural gas from Russia to Turkey, and across the Black Sea.

The total length of the system is approximately 1,250 kilometers. The gasline is designed to link the gas distribution network of the Krasnodar region in southern Russia to the central Turkish grid in the capital city of Ankara.

The crossing of the Black Sea is certainly the most challenging part of the entire project and is Saipem's scope of work.

Two 24" diameter sealines will enter the sea on the Russian side where the seabed profile near Beregovaya, falls dramatically.

Along their sub-sea route, the two pipelines shall descend to a record depth of 2,150 meters before emerging on the Turkish side at the city of Samsun.

Target gas flow: $16 \times 10^9 \text{ Sm}^3 / \text{y}$

Pipe diameter: 24 inches O.D.

Max water depth: 2,150 metres

Total length: 773 km

Pipe characteristics

Wall thickness: 31.8 mm

Steel grade: X65

Total steel weight: 350,000 tonnes

SERVICES SUPPLIED : engineering for corrosion prediction on hydro-test water.
Hydro-test water has been no treated.

Case History n° 10 (DOLPHIN PROJECT)
Year : 2005 - 2006



The **Dolphin Gas Project** is one of the largest trans-border energy projects ever undertaken in the Middle East. The project is expected to bring natural gas from Qatar via pipeline to meet the growing energy needs of the United Arab Emirates (UAE). The project will bring together three Gulf Cooperation Council (GCC) nations – the UAE, Qatar and Oman – into an integrated regional energy network for the first time. The first phase has involved the development of two platforms in Qatar's North Field and processing facilities at Ras Laffan. The second phase is the construction of a 48in diameter, 260 mile (370km) long sub-sea pipeline to carry gas to the UAE. The pipeline will carry up to two billion cubic feet of Qatar natural gas a day to the UAE for a period of 25 years. The pipeline does have the capacity to transport up to 3.2 billion cubic feet per day and additional customers are being booked.

Dolphin Energy Limited is the constructor and operator of the project. Dolphin Energy is owned 51% by Mubadala Development Company, on behalf of the Government of Abu Dhabi and 24.5% each by Total of France and Occidental Petroleum of the USA. The project, which has been underway since 2001, has cost an estimated \$7bn and is expected to be completed and on-stream in late 2006

Hydro-test water has been treated by the following products

CHEMICALS CONSUMPTION CALCULATION

Pipeline Description.	36" SL2 Offshore Section	36" SL2 Onshore Section	36" SL1 Offshore Section	36" SL1 Onshore Section	48" Export Offshore Section	48" Export Onshore Sec. Ras Laffan	48" Export Onshore Sec. Taweelah
Treatment A - Water is remaining in pipeline	35 days	18 days	124 days	15 days	11 days	12 days	79 days
Treatment B - Water is remaining in pipeline	32 days	-		-	32 days	-	-
Treatment C - Water is remaining in pipeline							

TREATMENT A	42.904,8	3.013,9	51.986,3	4.135,4	487.574,0	5.674,6	3.028,3	598.317,3
TREATMENT B	40.101,4				385.136,2			425.237,6
TREATMENT C			49.142,9					49.142,9
TOTAL SEAWATER TO BE TREATED (M3)	83.006,2	3.013,9	101.129,2	4.135,4	872.710,2	5.674,6	3.028,3	1.072.697,8

	Dosage gr/cubic meter							Total quantity Kg	
HYCOR OX 67	120	9.960,7	361,7	12.135,5	496,2	104.725,2	681,0	363,4	128.723,7
HYCOR SB	200	16.601,2	602,8	20.225,8	827,1	174.542,0	1.134,9	605,7	214.539,6

Case History n° 11 ADRIATIC SEA Year : 2006

For the hydro-testing procedures of **CROATIA OFFSHORE DEVELOPMENT 18" PIPELINE FROM IVANA K TO POLA** following chemicals have been used :

OXYGEN SCAVENGER : HYCOR OX 68

BIOCIDE : HYCOR SB

	HRVATSKI ZAVOD ZA TOKSIKOLOGIJU
[]
[]
<p>Saipem Mediteran Usluge d.o.o. A. Colonnello 2 51000 RIJEKA n/r Matija Stani</p>	<p>Hrvatski zavod za toksikologiju Martićeva 63 a, 10000 Zagreb Telefon: 01 46 41 389 01 46 98 910 Fax: 01 46 41 388 E-mail: hz@hzt.hr www.hzt.hr 060-02-01-06-2068 02-01-06-1172 Učin: 25.08.2006. U Zagrebu.</p>

Predmet: Toksikološko mišljenje za pripravak: **HYCOR SB**
Naručilac: Saipem Mediteran Usluge d.o.o.
Proizvođač: INTECNA srl, Italija

CAS broj	ime	%	znak	R oznaka
111-30-8	gluturaldehid	23,25	T,N	R:23,25,34,42/43,50

Prema Zakonu o kemikalijama (NN150/05) i sukladno Pravilniku o mjerilima za razvrstavanje otrova u skupine (NN 47/99) te prema podacima iz sigurnosno tehničkog lista za koji odgovara proizvođač proizvod **HYCOR SB** naznačenoj kemikalije, označena znakom **C** i oznakama **R:20/22,34,42/43** (štetno ako se udahne i ako se proguta, izaziva opekotine, može izazvati preosjetljivost udisanjem i u dodiru s kožom).

Voditelj Službe za izradu
toksikološkog mišljenja
Alka Wolf Copparda, dipl.ing.
spec.toksikolog



	HRVATSKI ZAVOD ZA TOKSIKOLOGIJU
[]
[]
<p>Saipem Mediteran Usluge d.o.o. A. Colonnello 2 51000 RIJEKA n/r Matija Stani</p>	<p>Hrvatski zavod za toksikologiju Martićeva 63 a, 10000 Zagreb Telefon: 01 46 41 389 01 46 98 910 Fax: 01 46 41 388 E-mail: hz@hzt.hr www.hzt.hr 060-02-01-06-2068 02-01-06-1172 Učin: 25.08.2006. U Zagrebu.</p>

Predmet: Toksikološko mišljenje za pripravak: **HYCOR OX 68**
Naručilac: Saipem Mediteran Usluge d.o.o.
Proizvođač: INTECNA srl, Italija

CAS broj	ime	%	znak	R oznaka
10117-38-1	kaljev sulfid		35-45 Xn	R:22,31

Prema Zakonu o kemikalijama (NN150/05) i sukladno Pravilniku o mjerilima za razvrstavanje otrova u skupine (NN 47/99) te prema podacima iz sigurnosno tehničkog lista za koji odgovara proizvođač proizvod **HYCOR OX 68** naznačenoj kemikalije, označena znakom **Xn** i oznakama **R:22,31** (štetno ako se proguta, u dodiru s kiselinama oslobađa otrovni plin).

Voditelj Službe za izradu
toksikološkog mišljenja
Alka Wolf Copparda, dipl.ing.
spec.toksikolog

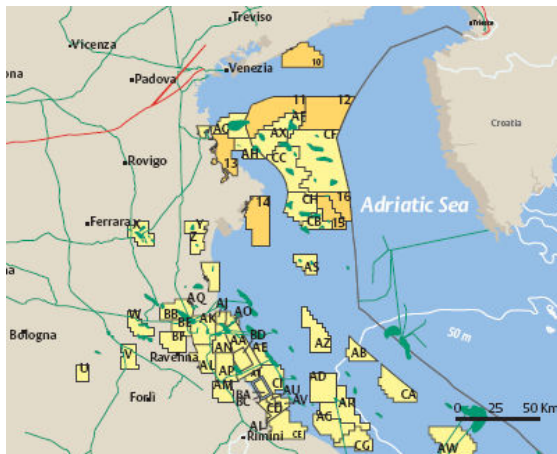


Case History n° 12 - ADRIATIC SEA TEA PROJECT Year : 2006

For the hydro-testing procedures of **ADRIATIC SEA TEA PROJECT** following chemicals have been used :

OXYGEN SCAVENGER : HYCOR OX 68

BIOCIDE : HYCOR SB



Case History n° 13 - DENISE PROJECT - MEDITERRANEAN SEA - EGYPT
Year : 2007

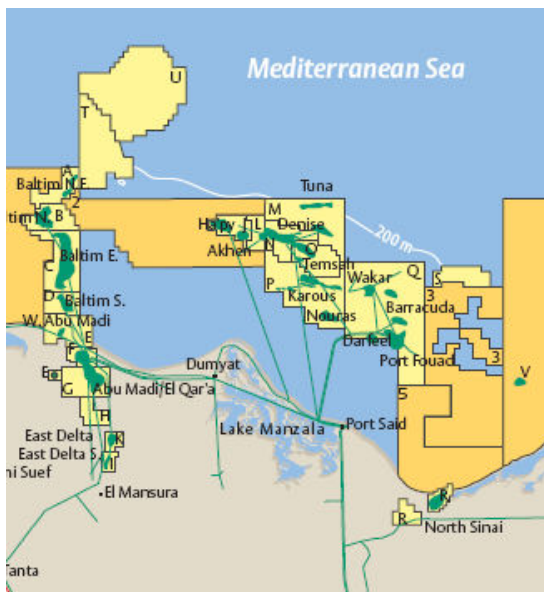
For the hydro-testing procedures of **DENISE PROJECT – Mediterranean Sea - Egypt Offshore** following chemicals have been used :

OXYGEN SCAVENGER : HYCOR OX 68

BIOCIDE : HYCOR SB

CORROSION INHIBITOR : HYCOR PHA

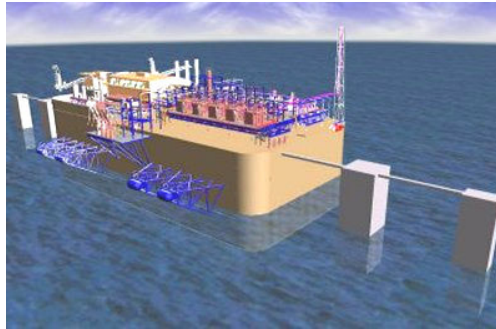
DYE : HYCOR FLS



Case History n° 14 - ADRIATIC SEA – LNG - PROJECT
Year : 2008

For the hydro-testing procedures of ADRIATIC LNG PROJECT following chemicals have been used

OXYGEN SCAVENGER : HYCOR OX 68



Case History n° 15 - HASDRUBAL – PROJECT TUNISIA Year : 2008

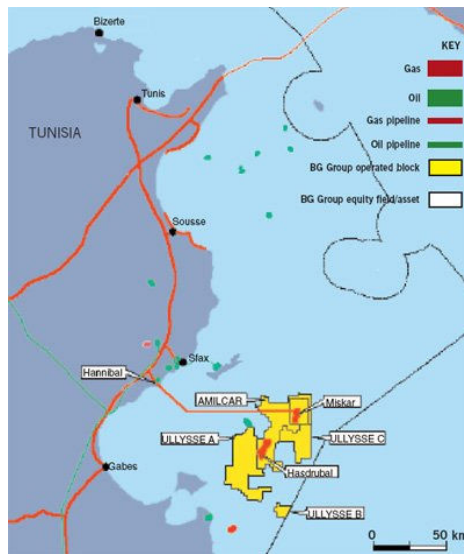
For the hydro-testing procedures of HASDRUBAL PROJECT following chemicals have been used

OXYGEN SCAVENGER : HYCOR OX 68

CORROSION INHIBITOR : HYCOR PHA

BIOCIDE : HYCOR SB

DYE : HYCOR FLS



Case History n° 16 - MAAMOURA PROJECT

TUNISIA
Year : 2008

For the hydro-testing procedures of MAAMOURA PROJECT following chemicals have been used

COCKTAIL TREATMENT : HYCOR MP

DYE : HYCOR FLS

