Rapport d'enquête technique

Report of safety investigation

DORIS

Bureau d'enquêtes sur les évènements de mer

Safety Investigation Report

Collision with a channel buoy then striking of the chemical/oil tanker vessel

DORIS

on 3 April 2009
in Lorient harbour entrance fairway

Warning

This report has been drawn up according to the provisions of Clause III of Act No.2002-3 passed by the French government on 3rd January 2002 and to the decree of enforcement No.2004-85 passed on 26th January 2004 relating to technical investigations after marine casualties and terrestrial accidents or incidents and in compliance with the "Code for the Investigation of Marine Casualties and Accidents" laid out in Resolution MSC 255(84) adopted by the International Maritime Organization (IMO) ON 16 May 2008.

It sets out the conclusions reached by the investigators of the *BEA*mer on the circumstances and causes of the accident under investigation.

In compliance with the above mentioned provisions, the analysis of this incident has not been carried out in order to determine or apportion criminal responsibility nor to assess individual or collective liability. **Its sole purpose is to identify relevant safety issues and thereby prevent similar accidents in the future**. The use of this report for other purposes could therefore lead to erroneous interpretations.

CONTENTS

APPENDIX LIST

Abbreviation list

AB	:	Able Bodied Seaman
AIS	:	Automatic Identification System
ARPA	:	Automatic Radar Plotting Aid
DSC	:	Digital Selective Calling
***BEA*mer**	:	*Bureau d'enquêtes sur les évènements de mer* (MAIB French counterpart)
cbm	:	cubic metre
dwt	:	dead Weight tonnage
ECDIS	:	Electronic Chart Display and Information System
EGC	:	Enhanced Group Call
EPIRB	:	Emergency Position Indicating Radio Beacon
GPS	:	Global Positioning System
IMO	:	International Maritime Organisation
ISM Code	:	International Safety Management Code
Length PP	:	Length between perpendiculars
MMSI	:	Maritime Mobile Service Identity
OOW	:	Officer Of the Watch
PSC	:	Port State Control
SART	:	Search & Rescue Radar Transponder
S-VDR	:	Simplified Voyage Data Recorder
SOLAS	:	International convention for the Safety Of Life At Sea
STCW	:	Standard of Training, certification and Watchkeeping
UTC	:	Universal Time Coordinated
HF, MF, VHF	:	High, Medium, Very High Frequency

1 CIRCUMSTANCES

DORIS loaded with a petroleum product coming from Russia, had a cargo for Lorient harbour where she arrived very early on 3 April 2009 morning.

The vessel was at 4.30 am on the leeward side of Groix Island to embark the pilot. The master was on the bridge. He was assisted by the chief officer and by an AB ; both had just taken over the watch.

Considering the very poor visibility, *DORIS* was first driven to a waiting anchorage looking forward to an improvement.

As the visibility was improving significantly, the pilot decided to sail the vessel in Lorient port through the western fairway.

DORIS was heading to her berth following first the " Les Soeurs " transit bearing. After having begun to turn from 057° to 016.5°, in order to steer on " Ile Saint-Michel " transit bearing the order " Starboard 20 " given to shift the helm had been wrongly understood and the helm had been put to the left. *DORIS* came rapidly on port and got out of the buoyed fairway and entangled the buoy chain with her screw. The damages suffered had been actually experienced only when the vessel got back in the fairway.

When "La Citadelle" was abeam the pilot observed that *DORIS* was not answering correctly to the helm. He then called for the tug *SCORFF* waiting at " Amiral " buoy. *DORIS* was not any more manageable, the steering was unpredictable. He stopped the headway abreast of Le Pot a shallow in the south of Le Cochon buoy.

Eventually berthed at the tankers wharf thanks to tugs help, *DORIS* discharged her refined petroleum product load. Two days later, the vessel was off in tow heading to Rotterdam in order to have her steering gear and her propeller repaired.

A floating dam had been positioned at the aft of the vessel in order to prevent any pollution risk.

2 BACKGROUND

2.1 Economical background

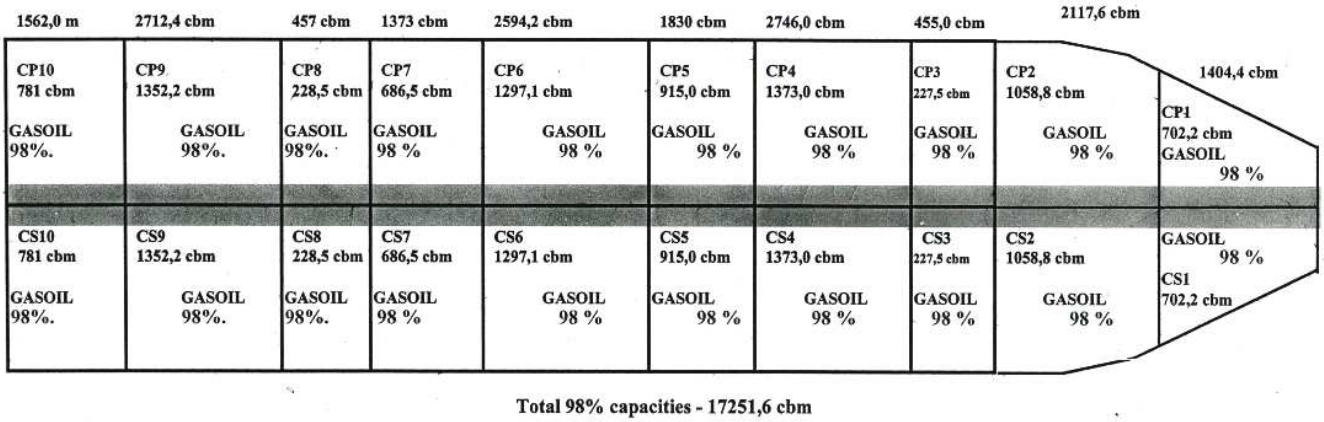
Utkilen AS a transport company which head office is in Bergen (Norway) has been established in 1967. It is one of the main bulk chemical liquid transporters operating in Northern Europe. It owns and operates more than 20 vessels ranging from 2,500 to 19,500 dwt. in size. This company has ordered the building of two new vessels to be delivered in 2009.

The flotilla is mainly registered in the Norwegian International Ship Register (NIS). The company employs about 370 Norwegian and international sea-going personnel and 50 desk-bound.

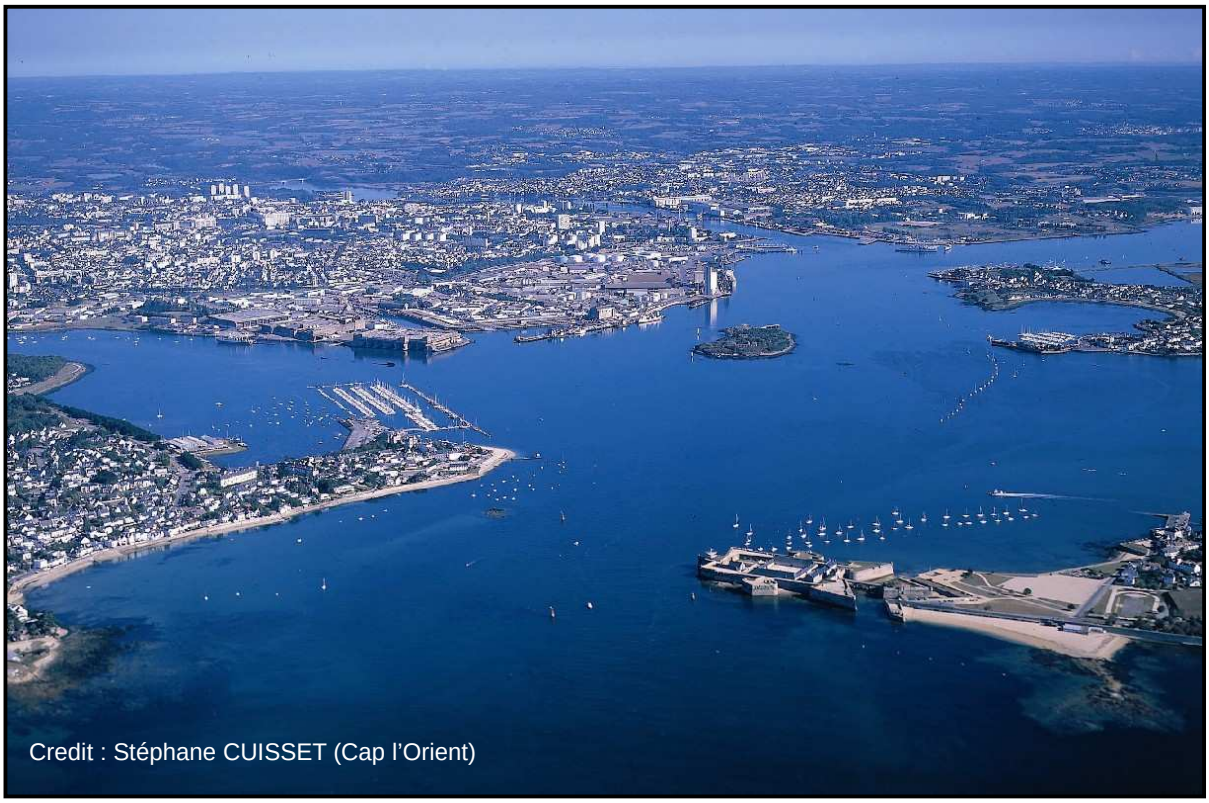
The company has in-house functions for chartering, operations, ship management and crewing.

DORIS is voyage chartered. At the time of the accident, she was on voyage 11-09 Saint Petersburg/Lorient. On 28 March 2009, she had loaded in her tanks 14389 t of Normal Russian Export Diesel oil 0.05 PCT, density 0,8282 at 20°C.

It is a petroleum product listed UN 1202 – IMDG class 3. It is designated as a light fuel oil. It is toxic for aquatic organisms and may cause long-term effects in the aquatic environment.



2.2 Nautical background



Lorient harbour can be accessed by two fairways : the Western fairway and the southern one. Both lead to the "Citadelle de Port-Louis" narrow path.

Pilotage is compulsory for any commercial vessel over 60 metres in length. Vessels have to communicate their ETA in "Coureaux de Groix" 6 hours in advance.

The pilot embarkation point is at 3 miles in the east-north-east from Pen Men Lighthouse (at the north-west extremity of Groix Island). However, when the visibility is less than 700 m, it is recommended to over 100 m vessels not to take the fairways.

The western fairway axis is marked by the range of Port-Louis lighthouse with Les Soeurs beacon tower. After having passed buoy A8, the range of the two lighted towers on Saint-Michel Island is to be used to sail through La Citadelle narrows heading 016.5°. Dangers on both sides of the channel are marked by beacon towers or buoys.

The minimum depth is 8m. The maximum draught admitted can reach 12.8 m. However for over 8 m draught vessels, the channel is not very wide. From a hundred metres at the entrance, the channel narrows to 60 m in La Citadelle narrows.

The Préfet Maritime de l'Atlantique rules navigation, anchorage and fishing in Lorient roads and approaches, as well as vessels carrying hydrocarbons or dangerous goods access and movement in Lorient Roads.

Arrêté (decree) n° 018/83 specifies that vessels carrying more than 500 cbm of hydrocarbons or dangerous goods in bulk have to take the western channel in the north of Banc des Truies and the main fairway passing in the west of Saint-Michel Island.

Moreover sailing through the channel is allowed, day and night, from 2 hours before high water to 1 hour after, and draught permitting from 1 hour before low water to 1 hour after and when the wind is less than 33 knots and the visibility over 700 metres.

For vessels over 125 m long without a bow thruster and for those over 140 m long fitted with a bow thruster (like *DORIS*) the escort by a tug is compulsory from La Citadelle. The tug has however to be on stand by in the vicinity of starboard buoy n°1, so called Bouée de l'Amiral, when the vessel is between Banc des Truies buoy and La Citadelle.

3 Vessel

3.1 Generalities

DORIS is owned by Utkilen Shipping KS (Norway). She is a combined chemical and oil tanker. She had been built in 1988 by STX Norway Offshore AS shipyard in Aukra (Norway).

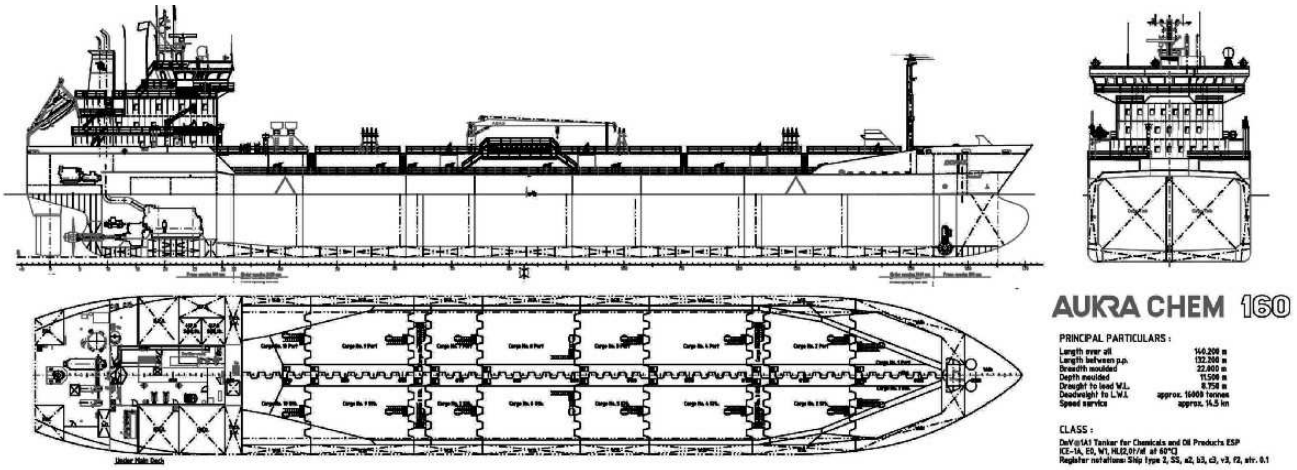
She is classed by Det Norsk Veritas « ✠ 1A1, EO, ICE 1A », which issues also international certificates on behalf of the flag state as well as the Safety Management Certificate (SMC).

All certificates are valid.

The vessel has been regularly inspected in the frame of Port State Control (PSC) according to Paris Memorandum of Understanding (Paris MoU), i.e. 15 times since January 1999. *DORIS* has never been detained since her commissioning. During these inspections 3 deficiencies had been retained in July 1999 and 1 in December 2006.

It has to be noticed that the target factor before the accident was 5 taking into account, among others, the low number, not to say the absence of deficiencies retained. This inspection priority is low and the flag is on Paris MoU “White list”.

3 . 2 Main characteristics

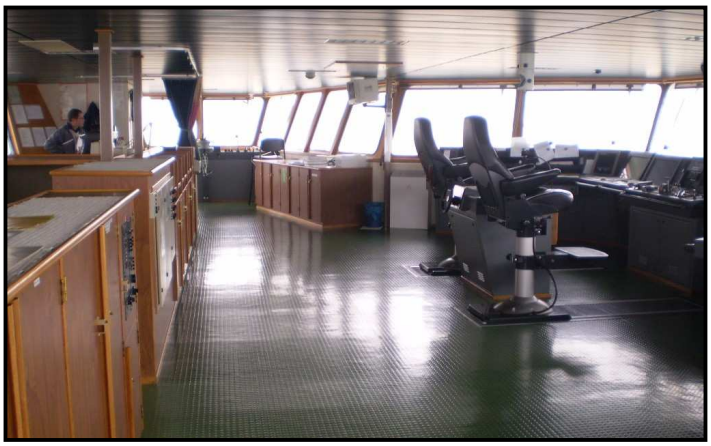


Vessel details:

- Call sign : LAGP5 ;
- MMSI : 259896000 ;
- OMI Registration Number : 9172210 ;
- Flag : Norwegian ;
- Registration port : Bergen ;
- Length overall : 140.20 m ;
- Length PP : 132.20 ;
- Breadth overall : 22.15 m ;
- Draught : 8.75 m ;

- Free-board (summer) : 2750 mm ;
- Gross tonnage : 9956 ;
- Net tonnage : 5019 ;
- Light displacement : 16028 t ;
- Load volume (100%) : 17619 m^3 ;
- Hull : double hull ;
- Main engine : Wärtsilä ;
- Main engine power : 5940 kW (7965 hp) ;
- Auxiliary group : Volvo 428 kW ;
- Auxiliary group : Wärtsilä 930 kW ;
- Bow thruster : Brunvoll 736 kW ;
- Reversing time : 4 min ;
- Crash stop time : 6 min ;
- Turning : Φ 280 m (5 min).

3.3 Navigational and safety equipments



DORIS is a vessel in a perfect state of maintenance. She is notably fitted with the following equipments :

- Navigational and bridge equipments ;
- GPS ;
- 2 Radars (9 & 3 GHz) ;
- ARPA ;
- AIS ;
- S-VDR ;
- Fathometer ;
- Magnetic compass ;
- Gyrocompass (with azimuth circle) ;
- Sailing directions and charts ;
- ECDIS ;
- Steering angle, bow thruster and pitch indicators.

Radio communications

The vessel, certified to operate in A1 + A2 + A3 zones, is fitted with :

- VHF ;
- MF/HF ;
- VHF (DSC) ;
- MF (DSC) ;
- INMARSAT (C standard with EGC) ;
- COSPAS-SARSAT EPIRB ;
- NAVTEX ;
- SART.

Propulsion and steering

Propulsion and propeller pitch are controlled from the bridge central control consol with additional controls on each wing.

Manoeuvring speeds are defined in the following chart :

	RPM	Pitch	Speed (loaded)	Speed (on ballast)
Full ahead	600	90	14.3	15
Half ahead	600	50	5	12
Slow ahead	600	25	5	7
Dead slow ahead	600	15	2	2
Dead slow astern	600	15		
Slow astern	600	25		
Half astern	600	50		
Full astern	600	70		

The maximum steering angle is 45° on each side. It takes 11 sec. from hard a port to hard a starboard.

The bow thruster (735 kW) is efficient under 4.5 knots.

3.4 Vessel data at the time of the accident

Draft forward : 8.67 m ;
Draft aft : 8.67 m ;
Draft amidships : 8.67 m ;
Trim : nil ;
Displacement : 15668.8 t.

4 CREW

The crew, according to the list shown by the master, was made of 16 members Norwegian, Philippinos and British :

- Four deck officers (master, chief officer, 2nd mate, 3rd mate);

- Three engineers (chief engineer, second engineer and lieutenant);
- 1 pumpman and 1 pumpman assistant ;
- 3 Abs ;
- 1 engineer workman ;
- 1 cook ;
- 1 steward ;
- 1 deck cadet.

All have the appropriate certificates and are fit to hold their respective positions in accordance with STCW 95 convention.

The two mates hold the GMDSS general certificate. One of them is in charge of radio communications in case of emergency.

The working language on board is the English, in accordance with SOLAS convention chapter V/14.

At the time of the accident, 4 persons were on the bridge: 3 crew members (master, chief officer, AB) and a pilot from Lorient pilot station.

The master, a Norwegian, aged 59, had embarked on board *DORIS* on 19 March 2009 in Norway. His previous embarkation was from 25 February 2009 to 7 March 2009. He has been at sea since 1967 on board tanker vessels. He has been employed by Utkilen Shipping KS company for 20 years. He holds a level 1 certificate (Deck officer Class 1, Master – unlimited) including among others the following certificates :

- General operator's certificate
- Ship Manoeuvring Simulator ;
- Tankerman Certificate ;
- Electronic Chart Display and Information System (ECDIS).

He has been in master positions for 13 years. He was coming in Lorient harbour with *DORIS* for the second time. The first call, by daylight, occurred one year before.

The chief officer, a Norwegian, on watch at the time of the accident, was 35 year old. He hold the « Basic Safety Training » STCW 95 level issued in 2002 by the « Far East Maritime Foundation INC » of Manilla.

This title includes the following trainings :

- Proficiency in Personal Survival Techniques ;
- Fire Prevention and Fire Fighting ;
- Elementary First Aid ;
- Personal Safety and Social Responsibility.

The three of them are physically fitted for their positions.

The pilot has been in this position since November 2004. Aged 40, he had begun a sea-going career in 1991 and all his postings had been on board tankers. He has been holding a master – unlimited certificate since 2001 when he took his first command.

He is physically fit for the pilot position.

Lastly an alcohol test had been done on both the master and the pilot by the Gendarmerie Maritime, that appeared to be negative.

5 SEQUENCE OF EVENTS

Local time : UTC +2

5.1 On 3 April 2009

The master who went to bed on **2 April 2009** at **10.00 pm**, got waken up on **3 April** at **3.30 am**, 1 hour before the pilot embarkation and got to the bridge at 3.55 am.

The pilot boat *KORVENN* left her berth at **4.00 am** on 3 April 2009. The observed visibility was at this time of about 1500 m between the *Citadelle* narrows and buoy A8. It was poor in the western channel.

On board *DORIS* the chief officer took over the watch at 4.00 am. He assessed the visibility to be about 300 m. At **4.15 am**, the machinery was ready to manoeuvre.

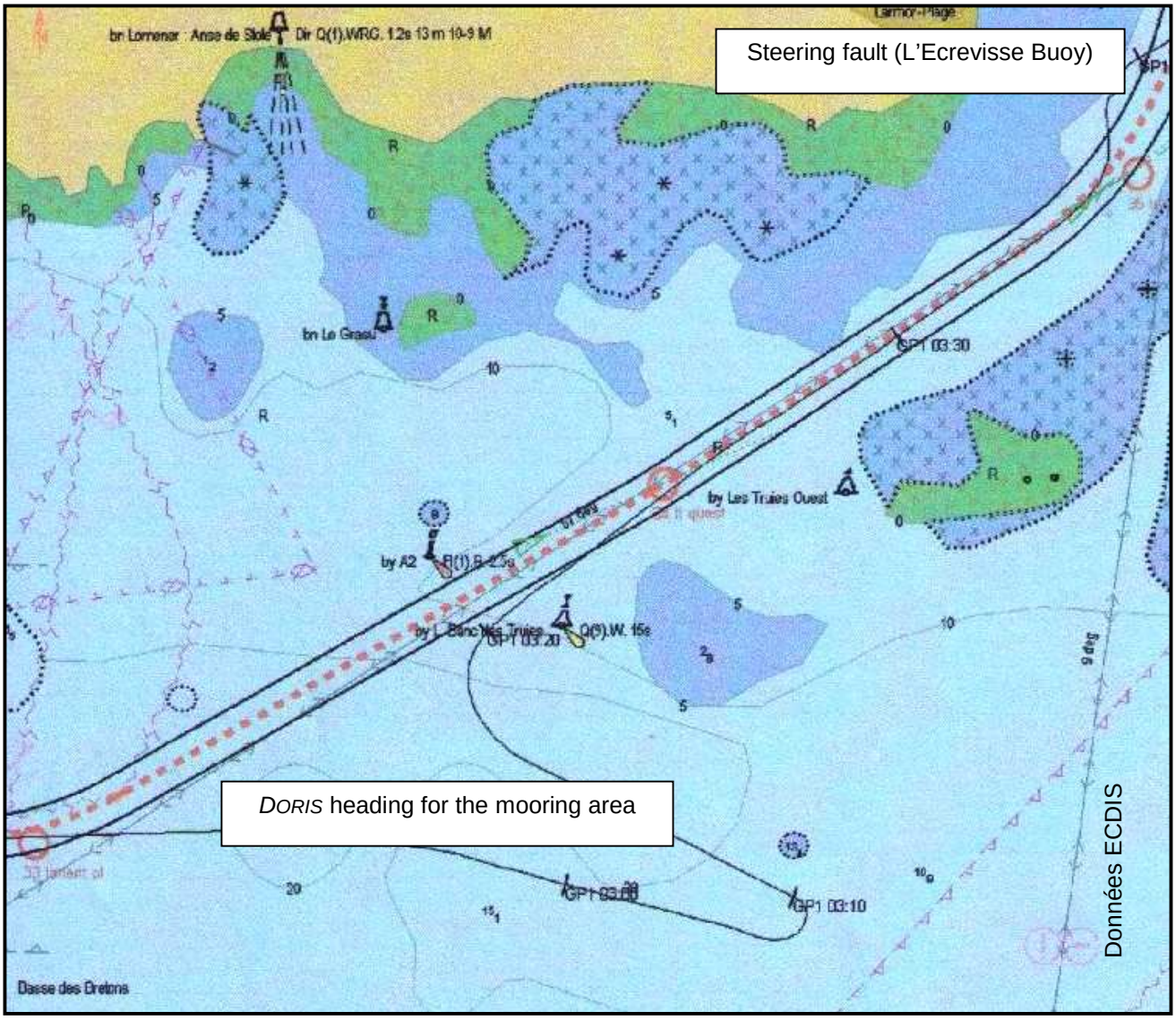
The pilot had embarked aboard *DORIS* at **4.30 am** ashore from Groix in order to go alongside at the tanker wharf in Lorient. The pilot had not been on board a vessel since the day before.

The latter, when he arrived on the bridge got information on the draught and precised to the master that the visibility was about 600 m and even 100 m at some place which was under the minimum requirement to sail in.

Taking into account the poor visibility, he decided, in agreement with the master to go to waiting anchorage area and to stay moored until at least 9.00 am, in the hope of a visibility improvement. It was then asked to the tug *SCORFF* on stand by in the vicinity of La Citadelle, in accordance with the regulation to stay there until further notice.

The navigational equipments were in operation. The radars were on, one with a 3 miles range and the other with a 1.5 mile range.

At **4.39 am**, the pilot informed the harbour master office of his intentions to anchor, due to the too poor visibility, which was only of 600 m, not good enough to sail *DORIS* in. If the visibility conditions should not improve, the vessel would be sailed in at the next high water.



At **4.45 am**, *KORVENN* skipper, returning to Lorient, was close to A2 buoy and informed *DORIS* pilot that the visibility was 0.2 mile.

At **4.54 am**, the pilot boat reported a 0.3 mile visibility close to A6 buoy. Then, 2 minutes later, still in the vicinity of A6 buoy, A8 buoy could be seen at 0.5 mile as well as Larmor lights but there was a fog patch in the entrance and les Soeurs range could not be seen.

According to the pilot, the visibility was improving slowly. In agreement with the master he decided to head not any more for the mooring area, but for the entrance range, intending to take the western channel.

The harbour master office and the tug were immediately informed.

Initially scheduled to leave her berth at **4.15 am** to assist *DORIS*, the tug *SCORFF* got underway with 4 men aboard at **5.12 am** to join her waiting area in the vicinity of buoy n°1 so called Bouée de l'Amiral. In this area the visibility was about of 600 to 800 m.

The tug main characteristics are as follow :

- length overall : 28.10 m ;
- displacement : 234 tonnes ;
- pull force : 31 tonnes ;
- winch brake force : 70 tonnes.

The navigation in the western channel was performed without any difficulty, at a moderate speed (6 knots, manoeuvring speed). The pilot was standing in front of the port radar display, the chief officer was coming and going on the bridge, the AB was lookout on starboard. As for the master, he was as usual for each port entrance, at the pitch and steering control console manoeuvring in accordance with the pilot indications. In the vicinity of A8 buoy, the visibility between this buoy and la Citadelle was then about 700 m.

As *DORIS* was closing A8 buoy, the pilot, focused on the radar display passed very close from this one in the left part of the channel. He initiated a left turn under autopilot control in order to head on the range of the two lighthouses of Ile Saint-Michel. *DORIS* came on her left. The course altering to come from 057° to 016.5° with a 10° angle was done normally.

When A8 buoy was abeam, the pilot asked to the master to shift to manual steering. The latter complied.

At **5.34 am**, in order to stop the vessel evolution on the left, a helm order “Starboard 20 !” is given to the master by the pilot. The latter observed, as soon as the order had been given, that the master instead of putting the helm to starboard had increased the angle to port. Until this instant, the helm and propulsion orders were acquiesced but not repeated.

Then the pilot ordered “starboard 30 !” then « Hard-a-starboard ! ». He enhanced the evolution with a kick by increasing the pitch to half ahead. The pilot informed then *SCORFF* of the steering error and asked her to close the tanker. At this time the visibility was very poor.

The vessels did not see each other although *DORIS* was close to L'Ecrevisse buoy and *SCORFF* in the vicinity of La Jument (0.4 mile).

Despite this remedial manoeuvre, the vessel carried on her evolution to port until heading 359°, at this time *DORIS* came out of the channel, between buoy A8 and L'Ecrevisse buoy. Due to the turning and, according to the pilot instant thoughts, to a striking, the speed which was around 6 to 7 knots, decreased to 2.6 knots.

In order to avoid a probable grounding, the tug *SCORFF* had been called upon urgently. Since 5.30 am, a thick patch of fog was covering the channel reducing the visibility to less than 50 metres according to the tug skipper.

Thanks to these manoeuvres, the vessel came back in the channel. The pilot asked the master to come to heading 050°. After that the pilot's indications have been clearly repeated by the master.

At **5.38 am**, vibrations and noises had been sensed. The pilot assessed then that a grounding had been avoided.

Two minutes later, the pilot informed *SCORFF* that *DORIS* was clear and actually in the channel.

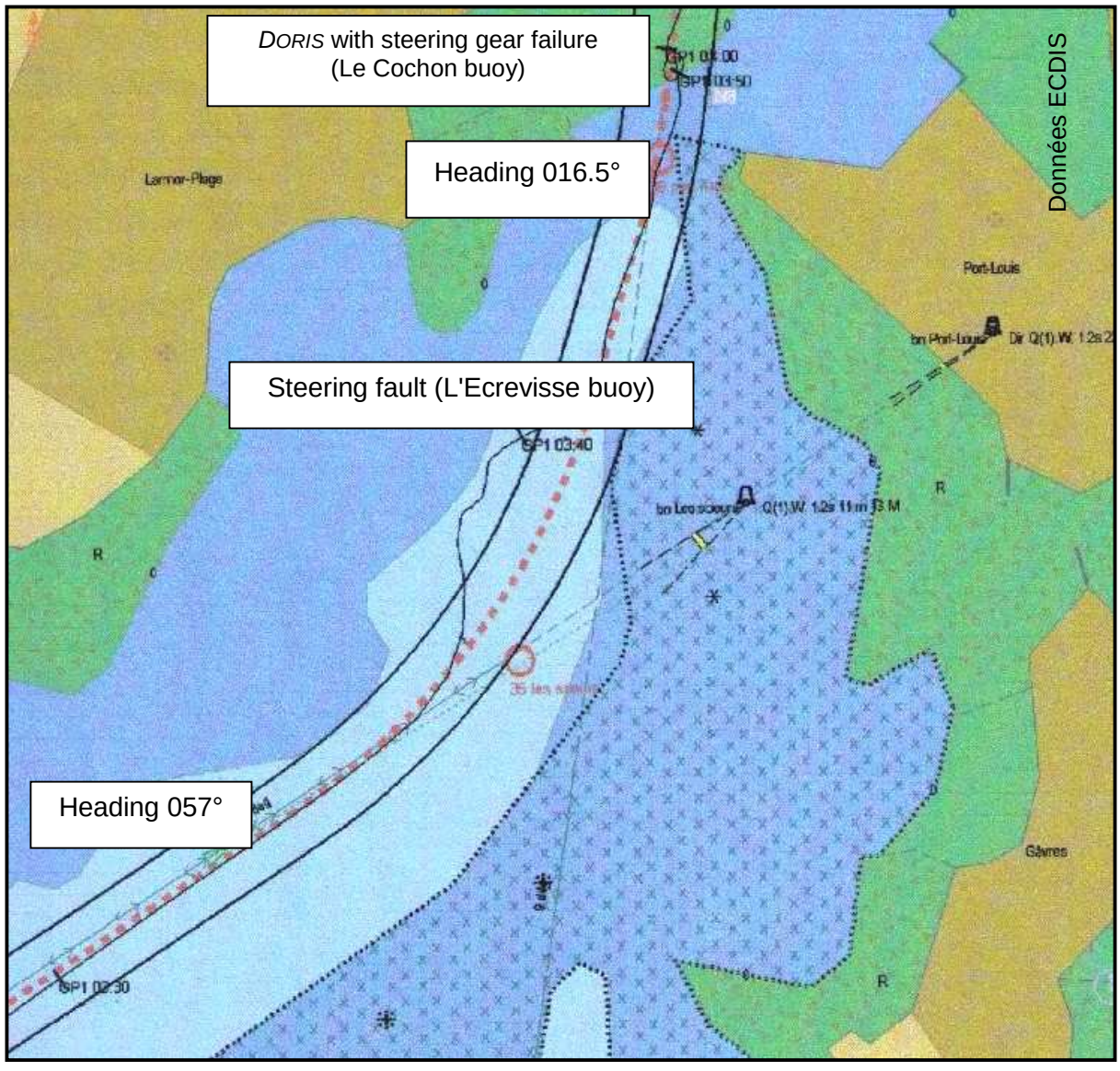
The urgent call for assistance had been cancelled and *SCORFF* rejoined her waiting position in the vicinity of La Citadelle. However it appeared that *DORIS* was not able to manoeuvre : steering steadily was difficult and the vessel was yawing.

At **5.42 am**, the pilot called again the tug for assistance because the vessel was impossible to steer.

DORIS attitude was observed by the tug skipper who interrogated the pilot. *DORIS* was dangerously heading to La Citadelle, which was due to the impossibility to steer.

The pilot who was initially giving heading indications, asked, from then on, for wheel angles. He was thinking then that the master had difficulties to steer. Orders were following one another.

When La Citadelle was abeam, heading 016.5°, the ve ssel came by herself on port. *SCORFF* skipper informed immediately the pilot that *DORIS* was closing Le Cochon beacon tower; the visibility was only about 10 metres. At the same time a loud noise could be heard coming from astern as if *DORIS* had just struck, although she was in safe water according to the pilot.



After that, at **5.45 am**, an engine room alarm informed of an hydraulic failure on the steering gear. The chief engineer went immediately to the engine room to check all the equipments. "High temperature" and "sternpost oil" alarms set off. During his investigation the chief engineer observed an important oil leak on the steering gear: the oil tank was at the low level. following the chief engineer's instructions, the third engineer sounded the cofferdams, the oil tanks, the gas tanks as well as the spaces under the platforms and established a general situation of the engine room. As for the master mechanic, he was in charge of maintaining the level in the oil tank for the steering gear. The master asked to the pumpman to check the ballasts.

The vessel headway had been stopped by reversing the engine. At **5.48 am**, *SCORFF* came close to *DORIS* starboard side in order to pass a tow line though the axial fairlead.

The pilot asked *SCORFF* for another tug (*MORBIHAN*) for an emergency assistance operation and informed the other pilot from Lorient station about the situation.

An investigation had been conducted in the engine room : the engine and the steering gear seemed to be operational and no pollution was observed. The chief engineer informed regularly the bridge about the state of the failures and hydraulic leaks in the steering gear compartment.

At this time, the starboard rear angle of the tanker was practically straight at the port signal level very close to Port-Louis Citadelle rocks.

At **5.51 am**, the pilot asked the master about the lack of buoys position on the ECDIS chart.

At **5.56 am**, *DORIS* was closing dangerously the eastern part of the channel. She moved away with difficulties thanks to the bow thruster and to *SCORFF* that towed the vessel by the stern at 5 tonnes. During this manoeuvre, *DORIS* stern veered to the north, which impeded considerably the manoeuvre, considering that the channel is only 100 m wide. *SCORFF* was at 2 or 3 m from the rocks. The visibility at this time was assessed to be between 50 and 100 m.

At **6.04 am**, the chief engineer informed the bridge that the oil level could hardly be maintained in the steering oil tank, which tended to prove that the oil was probably leaking into the sea. In the mean time *MORBIHAN* crew had rejoined her ship.

At **6.11am**, the pilot observed that *DORIS* had not grounded. Then on in safe water, the pilot decided to sail at slow speed. At 2 or 3 knots, *DORIS* was steering thanks to the tug *SCORFF* and the bow thruster. At **6.33 am**, the pilot informed Lorient harbour that the channel was free for navigation.

Another pilot rejoined *DORIS*. He took in charge internal and external communications.

At **6.38 am**, the call for assistance to *MORBIHAN* had been cancelled. At times the visibility was reduced to less than 25 m.

DORIS impaired sailed up to the tankers wharf at 2 knots with her engine dead slow ahead.

At **6.40 am**, the tanker was berthed.

The berthing and the pilotage operations ended at **7.15 am**. After the berthing, some iridescence were observed at the aft of the vessel, coming probably from the rudder stock tube. This limited pollution led the harbour authorities to set up a dam.

5.2 On 5 April 2009

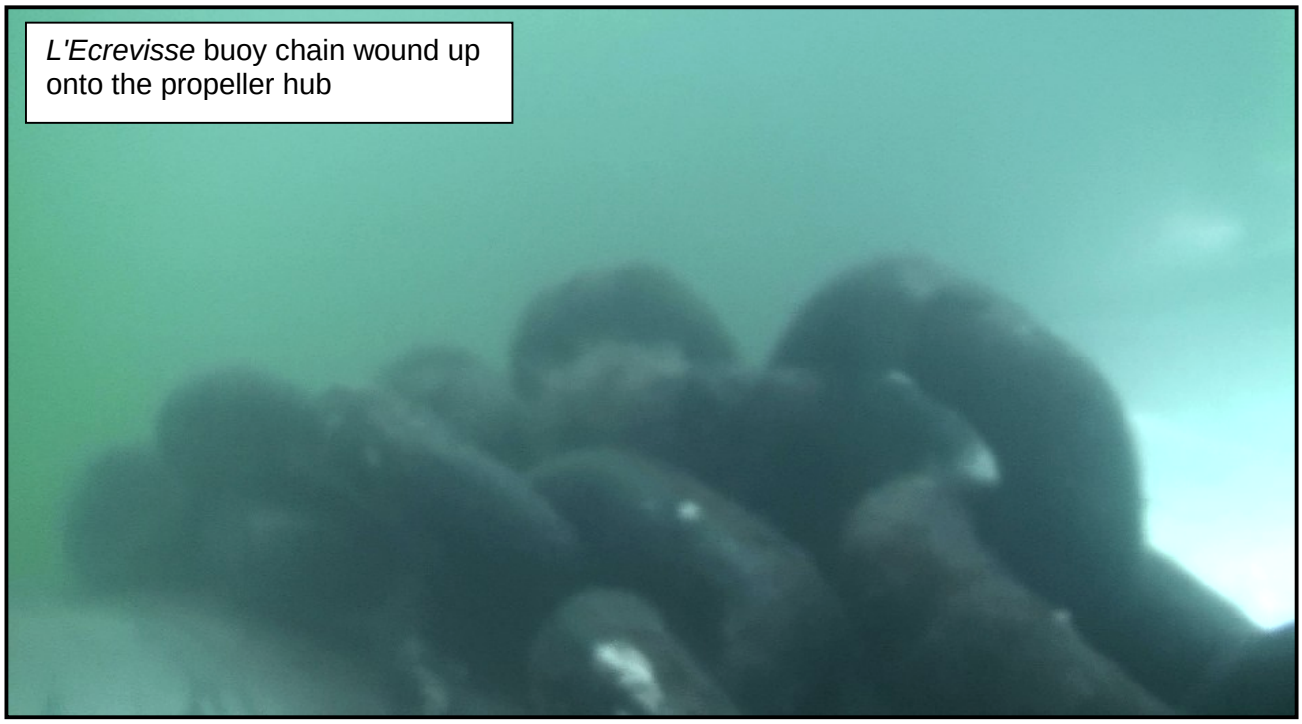
Credit : Patrick GUIGUENO

DORIS left Lorient harbour at about **1.00 pm** after having discharged her load. She had been taken under tow by the high-sea tug SUMATRA bound to Rotterdam (The Netherlands) in order to be repaired. The repair works were scheduled to end around mid-June 2009.

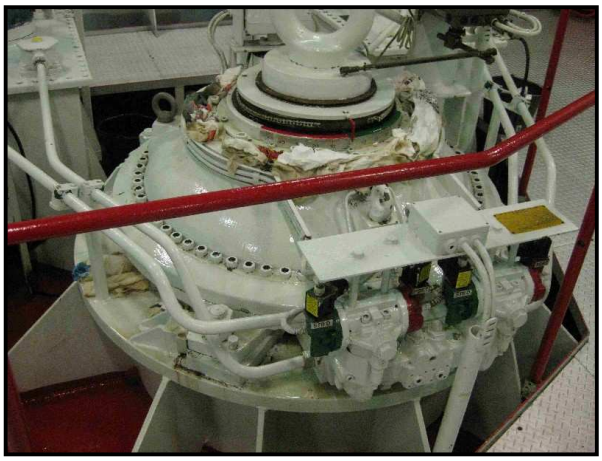
6 DAMAGE OBSERVATION

6.1 Vessel

The accident had led to important damages depriving the vessel of part of her propulsion and of her manoeuvring capacity. In fact, about 20 metres of chain had been wound up onto the propeller hub. All the blades were damaged as well as the rope cutter; the rudder was bent on starboard. The probable impact between the concrete mud anchor of the channel buoy and the rudder had broken the clamping bolts of the steering gear bottom part.



L'Ecrevisse buoy chain wound up onto the propeller hub



Credit : ISMER SARL

Lastly a light chafing 2 m long and 20 cm wide between rib 149 and rib 152 on starboard aft from the bow thruster, as well as a distortion of frame 150 could be observed. These damages did not prevent the vessel to be towed at sea.

Taking into account these damages, as these works could not be undertaken in *Lorient*, and in order to allow a transit in tow to a shipyard, the rudder had been blocked in a neutral position.

6.2 Channel buoy

L'Ecrevisse buoy, reported adrift by *Lorient* harbour master, had been recovered at 10.00 am on the same day between A6 and A8 buoys, opposite to *Les Saisies* plate.

The impact had caused the total loss of the mooring gear, made of 15 m of 30 mm chain and its concrete 1.2 tonne mud anchor.

The buoy itself had no damage.

Credit : DDEA 29/SMIB/SPBLO

6.3 Pollution

The leak at the rudder stock tube had caused the discharge of some hundreds litres of hydraulic oil. An anti-pollution dam had been set up at the stern of the vessel. The consequences on the environment had been very limited.

7 ANALYSIS

The method selected for this analysis is the method usually employed by *BEA*mer for all its investigations, in compliance with the "Code for the Investigation of Marine Casualties and Accidents" laid out in Resolution MSC 255(84) adopted by the International Maritime Organization (IMO).

The factors involved have been classed in the following categories :

- **natural factors ;**
- **material factors ;**
- **human factor ;**
- **other factors.**

In each of these categories, *BEA*mer investigators have listed the possible factors and tried to qualify them relatively to their characters :

- **certain, probable, hypothetical ;**
- **causal or aggravating ;**
- **circumstantial, inherent ;**

with the aim to reject, after examination, factors with no influence on the course of events and to retain only those that could, with a good probability, have a real influence on the course of facts. The investigators are aware that maybe they have not given an answer to all the issues raised by this accident. Their aim remains to avoid other accident of the same type ; they have privileged with no *a priori* an inductive analysis of the factors which have a significant risk of recurrence due to their inherent character.

7.1 Natural factors

7.1.1 Weather conditions

On 3 April morning, the pilot boat observed that the visibility was less than 1500 m between La Citadelle narrows and A8 buoy. It was poor in the western fairway.

At 4.00 am, the chief officer assessed the visibility to be 300 m. The pilot, once aboard the tanker, observed a poor visibility, under the required 700 m, and being not more than 100 m at some place.

Considering these conditions, and according to the regulation, in agreement with the master the pilot gave up sailing the vessel in and decided to anchor looking forward to improving conditions.

At 5.05, assessing that the visibility was improving, the pilot resumed the heading for the western fairway transit bearing. However, the visibility remained poor and changing ; at 4.54, the pilot boat skipper reported successively a 0.3 mile visibility at A6 buoy, then although he could see Larmor-Plage lights, but not at all Les Soeurs range, the visibility at A6 buoy got up to half-a-mile.

After the course altering to follow Ile Saint-Michel lights range the visibility was less than 100 m.

At 5.41 it was a zero visibility : DORIS was close to L'Ecrevisse buoy and *SCORFF* in the vicinity of La Jument could not see each other.

At 5.43, meteorological records, in the vicinity of Groix Island reported a 3 knot east-north-east wind, a sea-state 2 and a less than 200 metre visibility (fog).

In these conditions the navigation is tricky. It is why the entrance in Lorient channel for vessel transporting hydrocarbons or dangerous goods is allowed only day or night when the visibility is over 700 m.

The thick fog has then to be considered as a **circumstantial factor** that could have had an influence on the course of this event.

7.1.2 Tide

The maximum draught admitted to sail in the roads is 12.50 m during mean spring tide period and 11.30 m during mean neap tide period. According to the sea and swell conditions, the reduction from 0.50 to 1.50 m to take into account the wave height is not implemented.

The tide tables for Port-Tudy gave the following element on 3 April 2009 :

Coeff.	HWT	HWH	LWT	LWH	HWT	HWH	LWT	LWH
43	/	/	5.26 am	1.95 m	0.09 pm	3.95 m	5.58 pm	2.15 m

DORIS as a vessel transporting more than 500 cbm hydrocarbons could sail in Lorient channel only from 2 hours before the high water time to 1 hour after, or from 1 hour before the low water time to 1 hour after draught permitting.

In this case the draught was 8.67 m with a zero trim.

At the time of the event the water heights are as follow :

	Channel	Tanker wharf
elevation	7.20 m	9.80 m
Low water height	1.95 m	1.79 m
Height of water	9.15 m	11.59 m

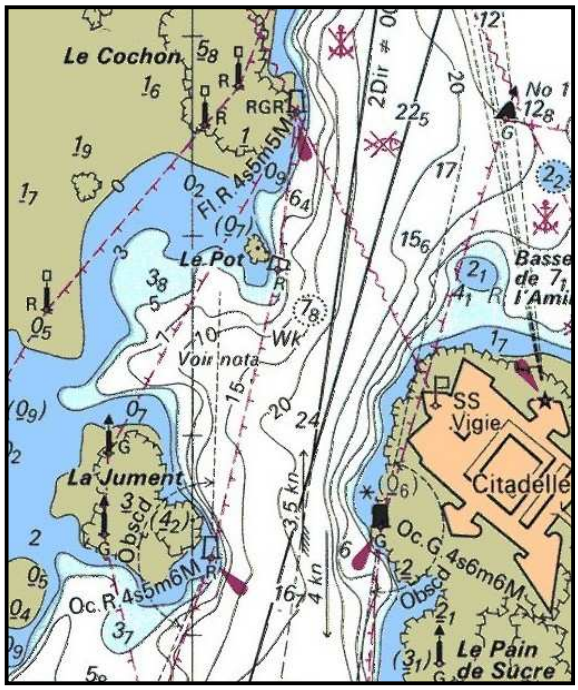
Nota : The elevation in the channel is actually of 8.00 m to which it is convenient to subtract a 0.80 m keel clearance : that is 7.20 m.

Consequently taking into account the draught, the tide conditions are not retained as having had an influence on the course of this event.

7.1.3 Channel

Both banks of the channel have a low elevation in comparison to the sea level, but they are lined with rocks in the mediolittoral and infralittoral fringe that could represent a hazard to navigation.

Dangers on both sides of the channel are marked by beacon towers, buoys or spars, lighted or not.



Thus one can find on the eastern side of the entrance of the channel la Potée de Beurre then La Citadelle (named after the nearby military fortification from the XVI th century in Port-Louis), and on the western side, Toulhars rocks, La Jument, Le Pot and Le Cochon.

For more than 8 metres draught vessel the channel is narrow, from a maximum of a hundred metres at the entrance, the channel narrows to 60 m in La Citadelle narrows. Particularly on the eastern side where an awash shoal jut out 30 metres in the NW from La Citadelle beacon tower.

Close to Port-Louis Citadelle, between starboard-hand buoy N° 1 and Le Pot buoy, the tidal stream is crossing and setting, during flood and ebb as well, onto Basse du Pot and La Jument (during flood because of current coming from Locmalo bay; during ebb due to current coming from Port-Louis).

The Lorient channel topography and its limited width are retained as **aggravating factor** in case of failure or swerving.

7.2 Material factors

No failure concerning bridge equipments, engine or steering gear had been observed before the event.

Radars, ECDIS, VHF sets and fog horn are on operation.

However, abreast of *Le Pot* buoy the pilot noticed that the maritime signalisation was not figured on one of the ECDIS displays. This was due to the fact that the vessel did not hold a licence for the appropriate software. It is also to be noticed that there were no paper chart of *Lorient* entrance.

A recent inspection in the MoU frame was aimed on the navigational equipments : no observation had been issued on this point.

Eventually this is not to be considered as a contributing factor as the pilot has an extensive knowledge of the area and that the buoys are detected without any ambiguity on the radars.

7.3 Human factor

7.3.1 Regulation respect

Taking into account the thickness of the fog encountered as soon as the pilot was aboard, *DORIS* should have been taken to the anchorage area in order to wait for a significant visibility improvement instead of steering in Lorient and thus to respect the terms of the Arrêté (decree) 018/83 – 3 June 1983.

Actually after a first leg heading for the mooring area, the pilot assessed that the visibility was improving. At 5.05 DORIS made thus a U-turn in order to enter the mouth of the western Lorient fairway. At this time the visibility was half-a-mile.

The improvement had been very localized and temporary. Very soon after DORIS had been in a very thick fog until she had been berthed at the tankers wharf. Soon after she had collided with L'Ecrevisse buoy, the visibility was reduced to nil. It was barely better abreast of Le Pot and La Jument.

The decision made to steer the vessel in with very poor to zero visibility condition is a **potentially aggravating factor** of the consequences of the event, insofar as the bridge team did not realise immediately that the vessel had collided the buoy.

7.3.2 Work organisation on the bridge

Aboard *DORIS* the master himself is the helmsman during manoeuvre periods, which is according to the investigators' view quite amazing. Indeed, given that the master is in charge of the vessel in any circumstances, the fact to be at the helm does not allow him to hold properly this responsibility. Moreover, neither the OOW nor the AB is monitoring the "master-helmsman".

Besides, contrary to the usual practice, the pilot's steering indications are not repeated, but only acquiesced, which does not allow the latter to be sure that the orders are well understood and then properly executed.

The investigators consider that this organisation is a **causal factor** of the accident.

7.4 Executive summary

The oil/chemical tanker *DORIS* was approaching Lorient harbour on 3 April 2009 at 4.30 am, pilot aboard. The visibility was poor to nil.

After having considered, at first, to sail to a waiting anchorage, it had been eventually decided to steer into the western fairway. The master himself was steering manually.

Abreast of buoy A8, a fault in the execution of a steering order led the vessel to swerve and to collide L'Ecrevisse buoy on her starboard. The mooring line of this buoy had been wound up onto the propeller hub, the concrete mud anchor had damaged the rudder.

Then on, the vessel became difficult to steer. Abreast of Le Pot buoy, she had struck, not severely however.

She had been taken in charge by the harbour tug *SCORFF*, that was in a stand by position according to the regulation.

DORIS berthed eventually in Lorient harbour, not without difficulties. A dam set at the stern staunched a low scale pollution.

8 RECOMMENDATIONS

The *BEA*mer recommends :

8.1 To the owners

To fit their vessels with charts, electronic or paper kind, necessary for the planned navigations ;

To remind to the masters to put in place a bridge organisation that allows them to assume their responsibilities.

8.2 To pilots and masters

To use on the bridge standard procedures to transmit orders.

LISTE DES ANNEXES
APPENDIX LIST

Annexe A
Appendix A

Décision d'enquête
Enquiry decision

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

Bureau d'enquêtes sur
les événements de mer

Paris, le 09 AVR. 2009
N/réf. : BEAmer
000004

BEA mer

DÉCISION

Le Ministre l'Ecologie, de l'Energie, du Développement durable et de l'Aménagement du territoire;

Vu la loi n° 2002-3 du 3 janvier 2002 relative aux enquêtes techniques après événements de mer ;

Vu le décret n° 2004-85 du 26 janvier 2004 relatif aux enquêtes techniques après événement de mer, accident ou incident de transport terrestre ;

Vu le décret du 09 septembre 2008 portant délégation de signature (Bureau d'enquêtes sur les événements de mer) ;

Vu le décret du 09 juin 2008 portant nomination du Directeur du Bureau d'enquêtes sur les événements de mer ;

Vu le SITREP SAR CIRC OMI 115 Unique établi le 03 avril 2009 par le CROSS Etel ;

DECIDE

Article 1 : En application de l'article 14 de la loi sus-visée, une enquête technique est ouverte concernant l'échouement du pétrolier *DORIS* survenu le 03 avril 2009 à l'entrée du port de Lorient, immatriculé sous le N° 9172210 et battant pavillon norvégien.

Article 2 : Elle aura pour but de rechercher les causes et de tirer les enseignements que ces événements comportent pour la sécurité maritime, et sera menée dans le respect des textes applicables, notamment le titre III de la loi sus-visée et la résolution MSC.255 (84) de l'Organisation Maritime Internationale.

Pour le Ministre et par délégation
Le Directeur du BEAmer
Jean-Pierre MANNIC

Ministère de l'Écologie,
de l'Energie,
du Développement durable,
et de l'Aménagement
du territoire

BEAmer

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92055 LA DEFENSE CEDEX
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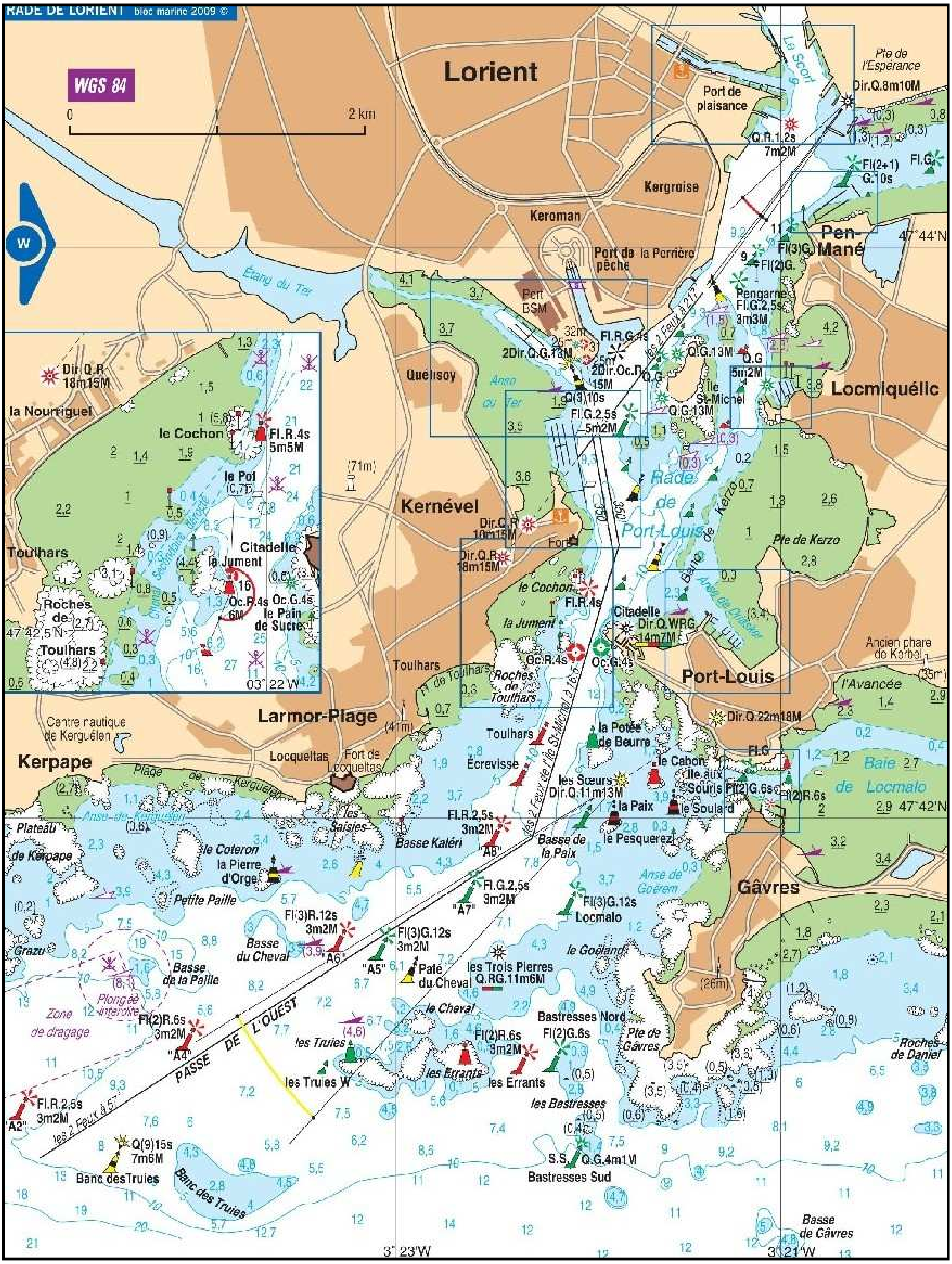
Annexe B
Appendix B

Cartographie
Chart


RADE DE LORIENT bloc marine 2009 ©
WGS 84
0
2 km
Lorient
Port de plaisance
Kergroise
Keroman
Port de pêche
la Perrière
Quélisoy
Kernével
Locmiquélic
Pen-Mané
Rade de Port-Louis
Port-Louis
Larmor-Plage
Kerpape
Toulhars
Locqueltas
Gâvres
Baie de Locmalo
PASSE DE L'OUEST
Banc des Truies
Bastresses Sud
les Bastresses
3°23'W
3°21'W
47°44'N
47°42'N

Annexe C
Appendix C

Trajectographies
Motion analysis

L'Ecrevisse

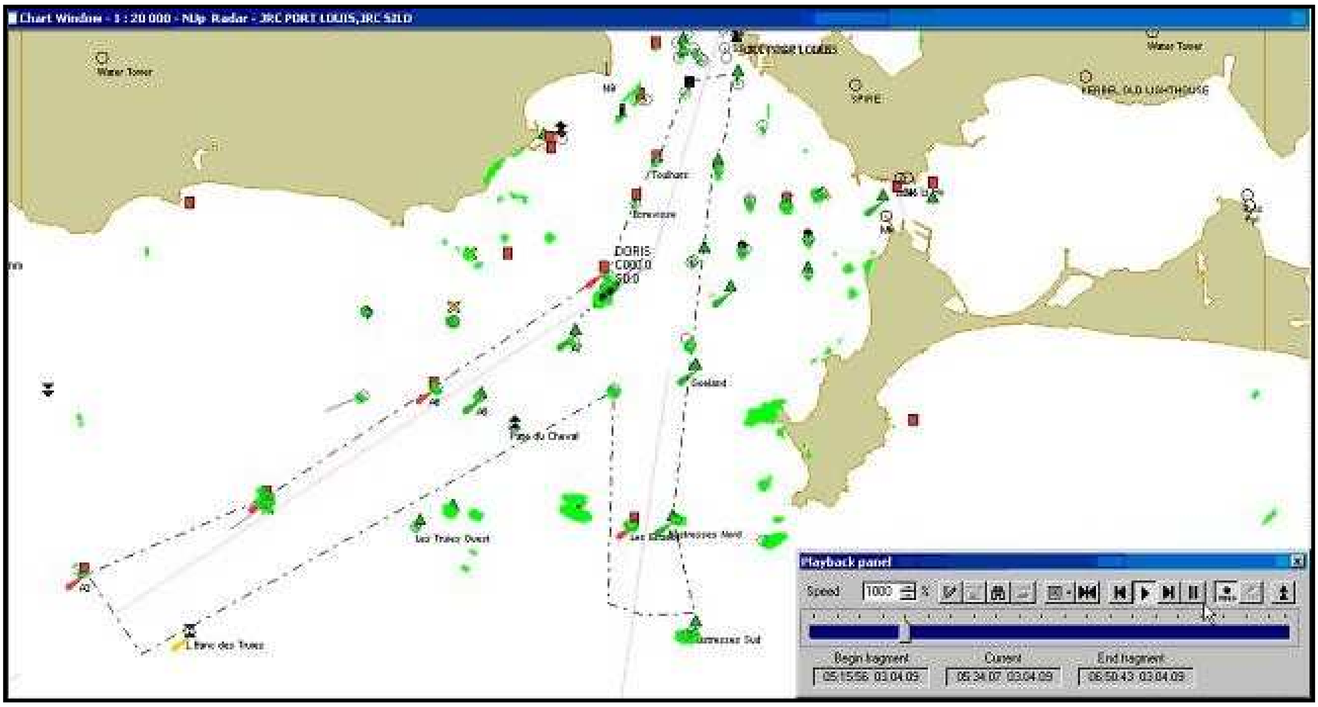


Chart Window - 1 : 20 000 - NUp Radar - JRC PORT LOUIS,JRC SILO
Water Tower
SPIRE
Toulhars
Ecrevisse
DORIS
Les Truies Ouest
Playback panel
Speed
1000
Begin fragment
Current
End fragment
05:15:56 03.04.09
05:34:07 03.04.09
06:50:43 03.04.09

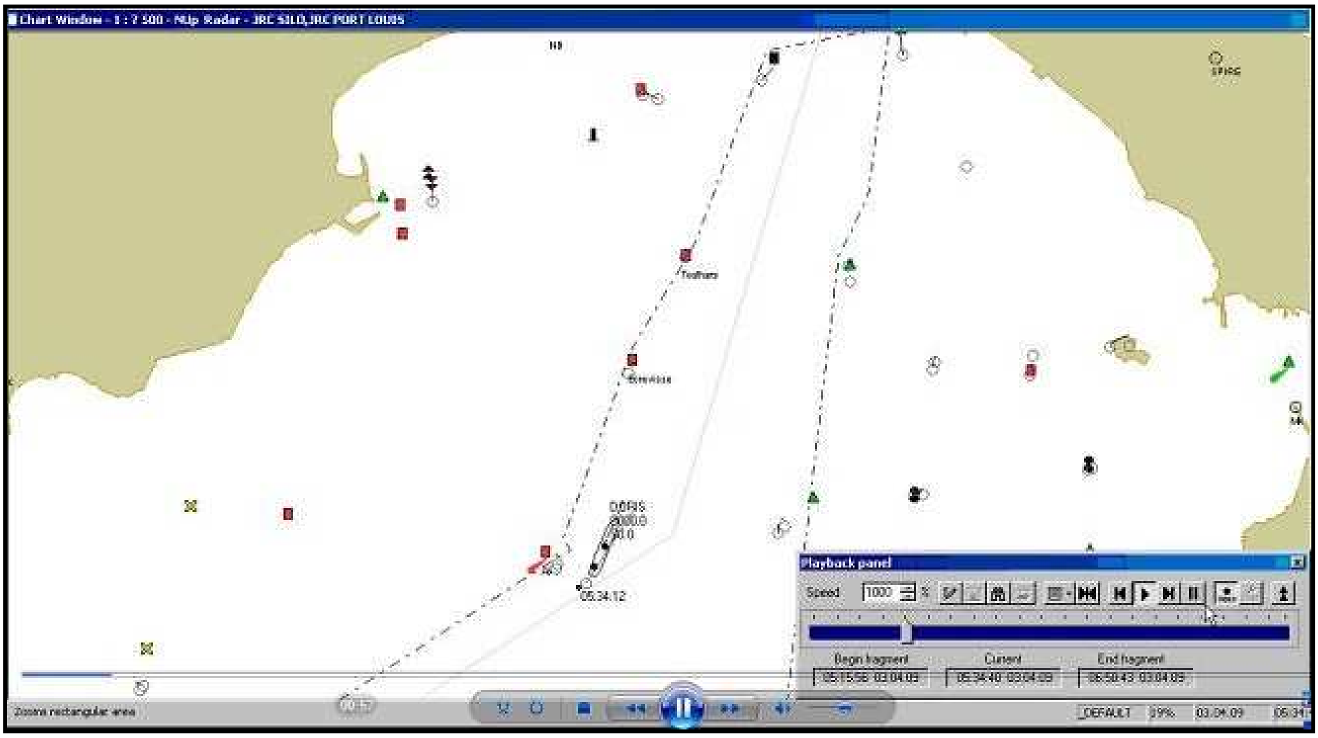
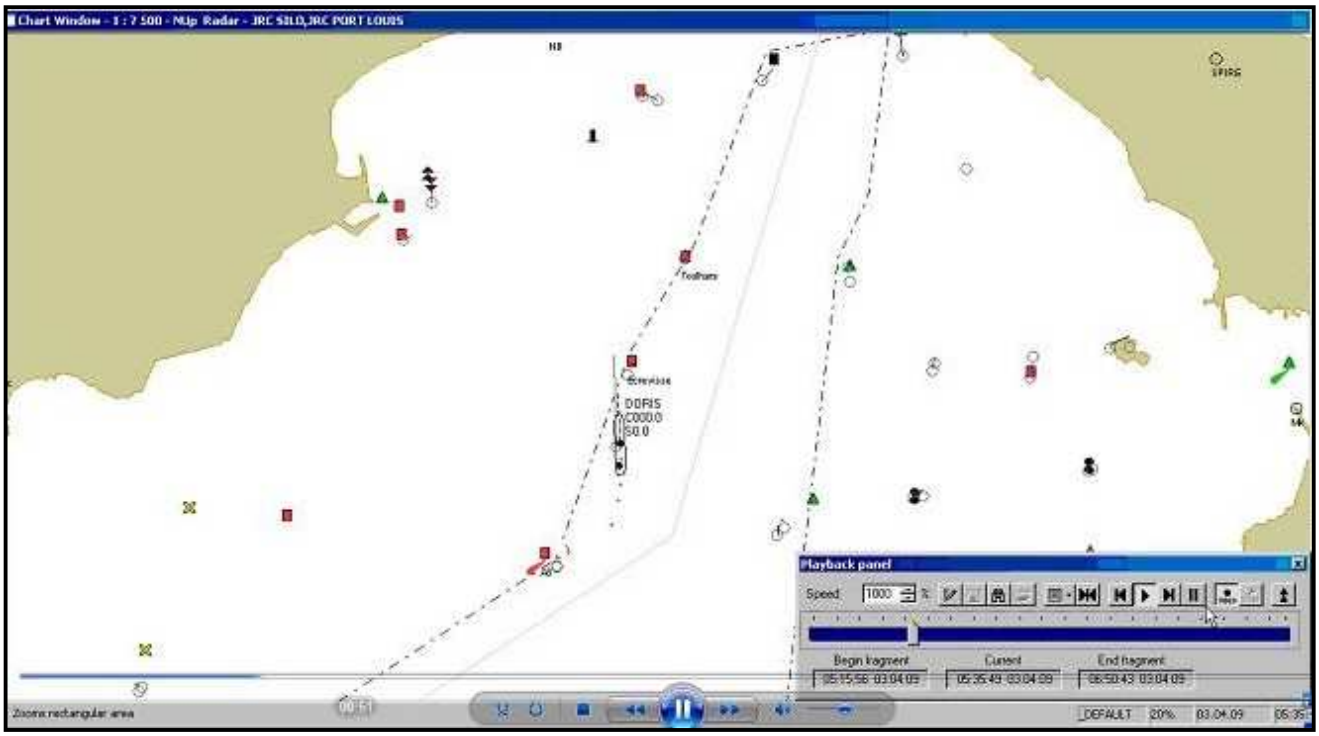


Chart Window - 1 : 7 500 - NUp Radar - JRC SILO,JRC PORT LOUIS
SPIRE
Toulhars
Ecrevisse
DORIS
05:34:12
Playback panel
Speed
1000
Begin fragment
Current
End fragment
05:15:56 03.04.09
05:34:40 03.04.09
06:50:43 03.04.09
DEFAULT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Playback panel
Speed
Begin fragment
Current
End fragment

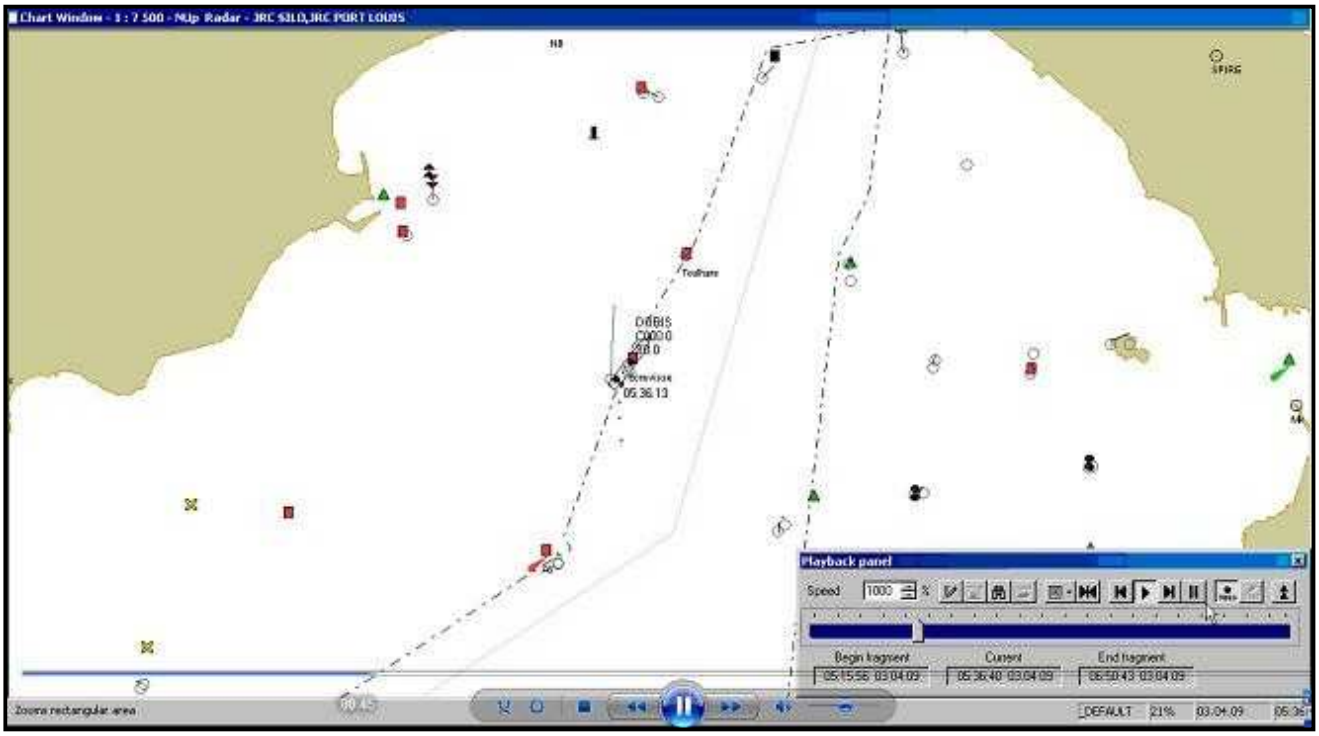
Chart Window - 1 : 7 500 - NUp Radar - JRC S3LD,JRC PORT LOUIS
Playback panel
Speed
Begin fragment
Current
End fragment

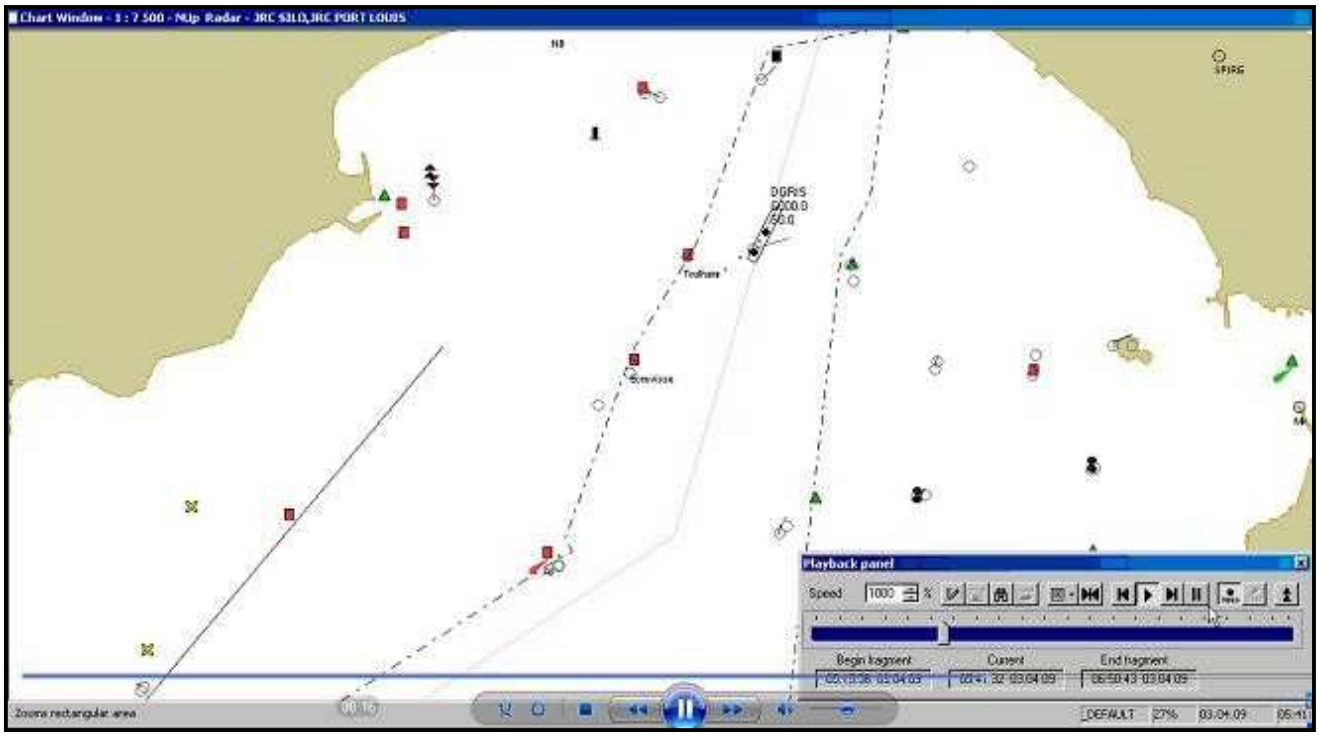
Chart Window - 1 : 7 500 - NUp Radar - 3RC SILO,3RC PORT LOUIS
DGRIS
Playback panel
Speed
Begin fragment
Current
End fragment
DEFAULT

Le Cochon

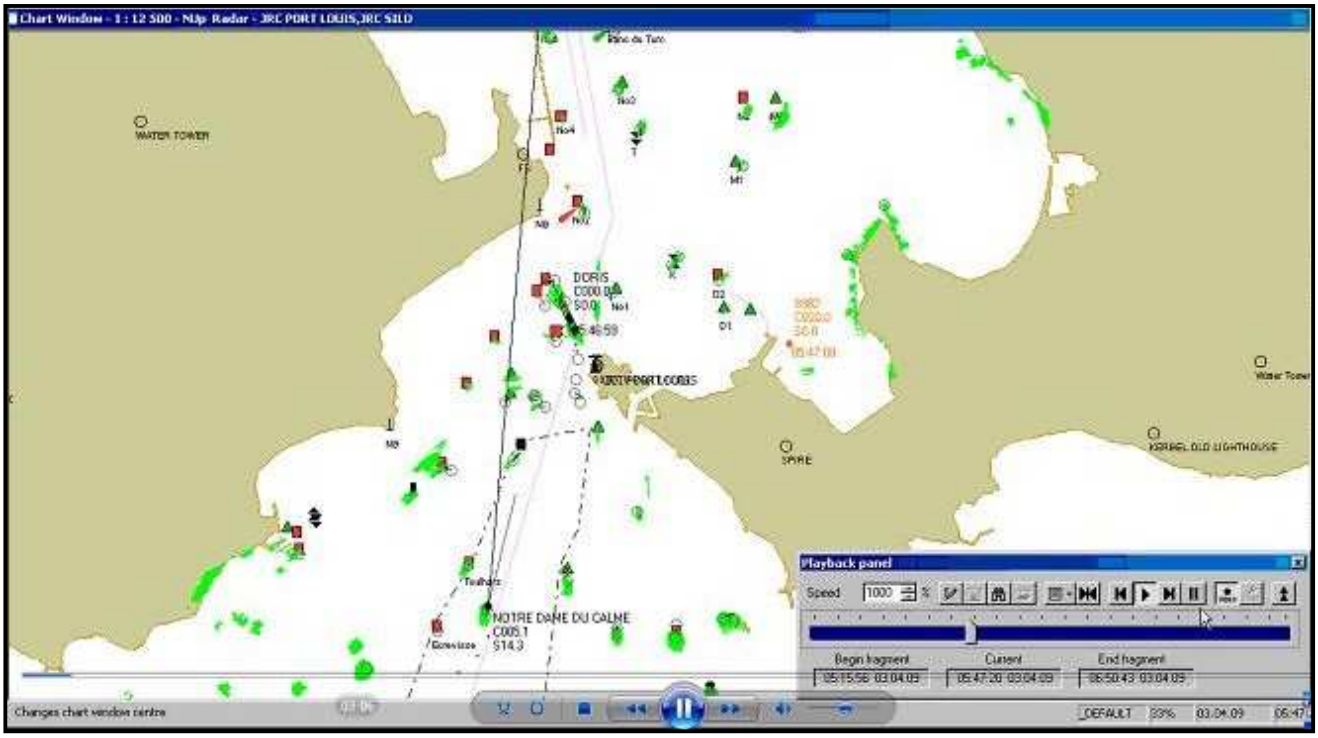
Chart Window - 1 : 12 500 - NUp Radar - JRC PORT LOUIS,JRC SILO
WATER TOWER
DORIS
C000.0
S20.0
PORT LOUIS
SPIRE
KERMEL OLD LIGHTHOUSE
NOTRE DAME DU CALME
C005.1
S14.3
Playback panel
Speed
1000
Begin fragment
Current
End fragment
Changes chart window centre
DEFAULT

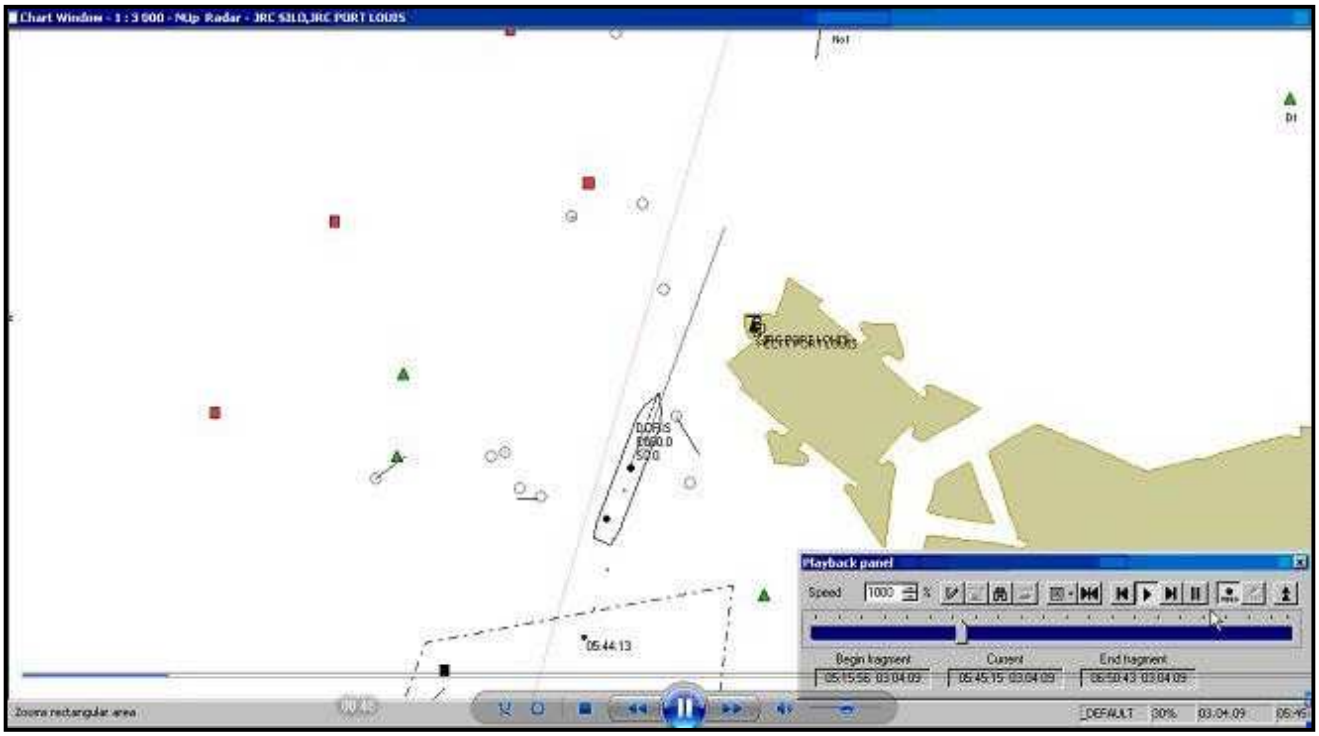
Chart Window - 1 : 3 000 - NUp Radar - JRC SILO,JRC PORT LOUIS
DORIS
C000.0
S20.0
05:44:13
Playback panel
Speed
1000
Begin fragment
Current
End fragment
Zoom rectangular area
DEFAULT

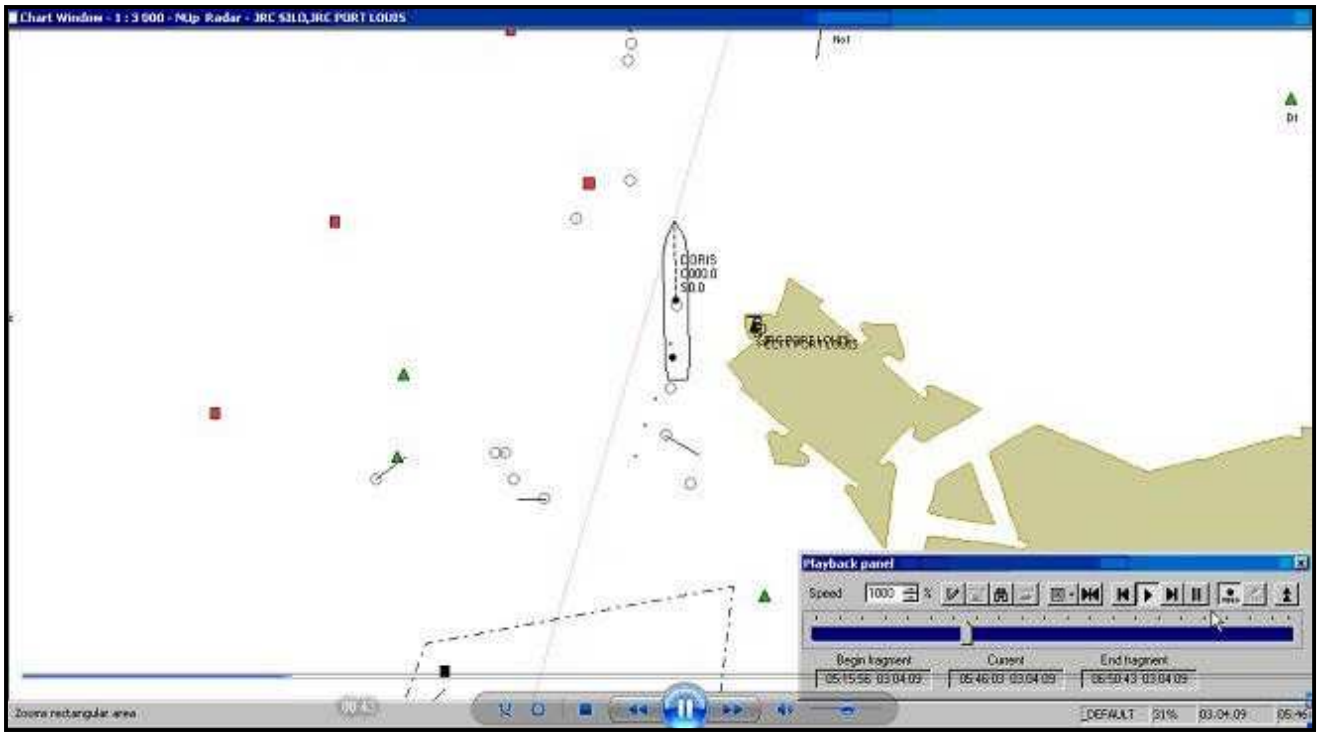
Chart Window - 1 : 3 000 - Nkp Radar - JRC S3LD,JRC PORT LOUIS
DORIS
C000.0
S0.0
Playback panel
Speed
1000
Begin fragment
Current
End fragment
05:15:56 03.04.09
05:46:03 03.04.09
06:50:43 03.04.09
Zoom rectangular area
DEFAULT
31%
03.04.09

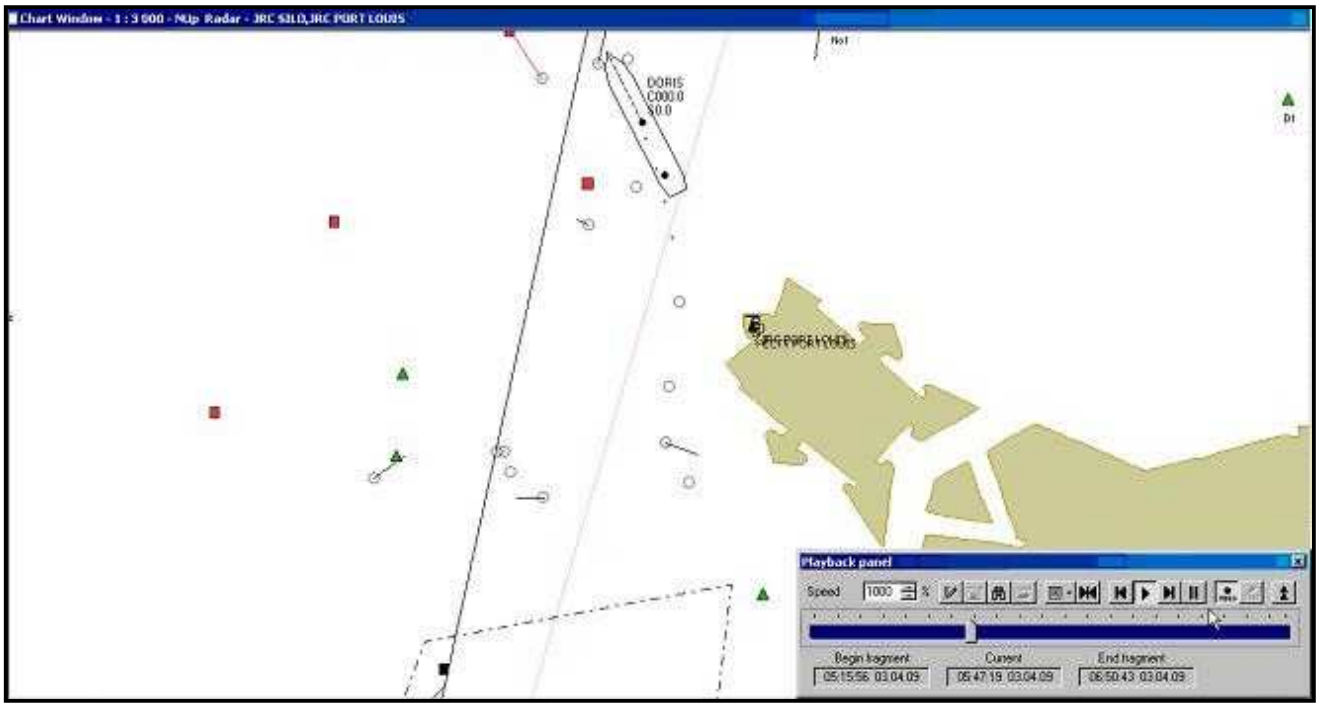
Chart Window - 1 : 3 000 - Nkp Radar - JRC S3LD,JRC PORT LOUIS
DORIS
C000.0
S0.0
Playback panel
Speed
1000
Begin fragment
Current
End fragment
05:15:56 03.04.09
05:47:19 03.04.09
06:50:43 03.04.09

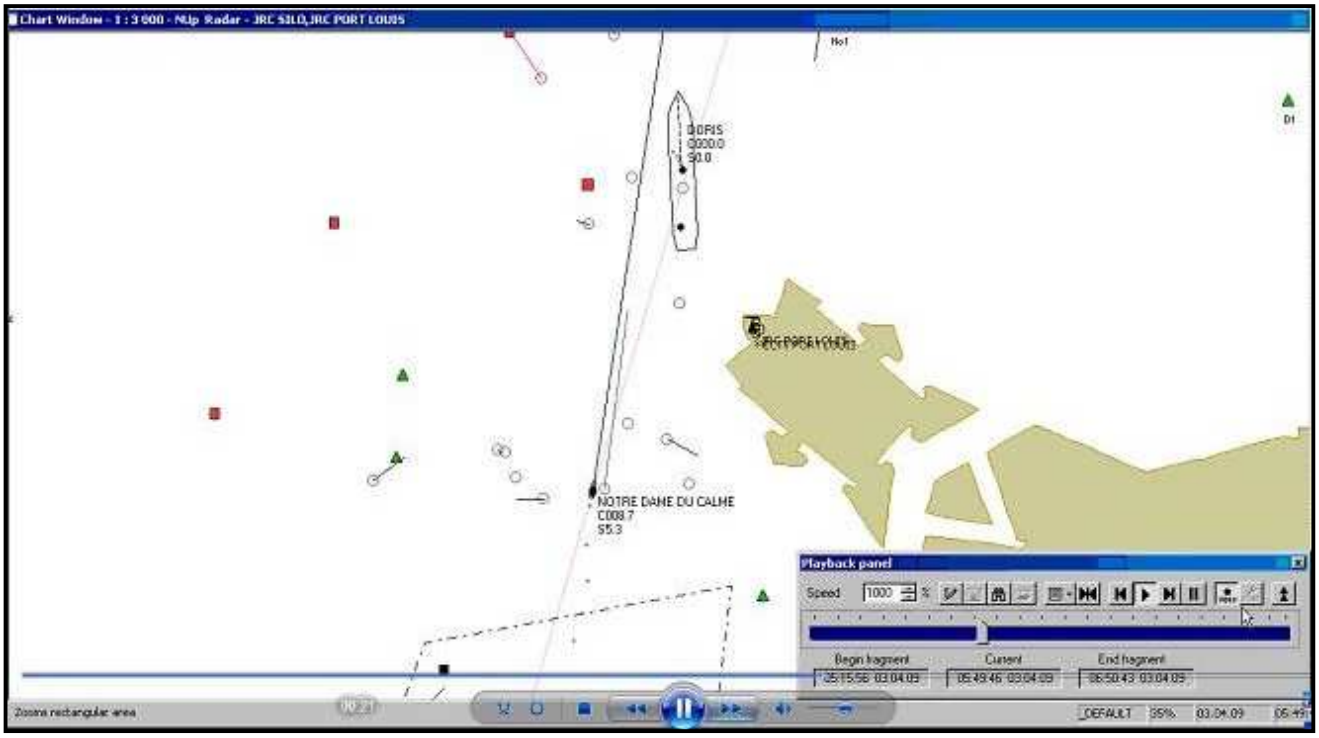
Chart Window - 1 : 3 000 - NUp Radar - JRC S3LO,JRC PORT LOUIS
NOTRE DAME DU CALME
C008.7
S5.3
Playback panel
Speed
1000
Begin fragment
Current
End fragment
Zoom rectangular area
DEFAULT
95%

Ministère de l'Ecologie, de l'Energie, du Développement durable et de la Mer

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