





marine casualty

Petro Giant Drilling Ship (Platform)

Injury to the left hand of an able-bodied seaman (able seaman, hereinafter also A/B) while working at the hook block on 30 April 2023.

December 2023





The investigation of the marine casualty on board the Petro Giant drilling ship was conducted based on the Act of 31 August 2012 on the State Marine Accident Investigation Commission (Journal of Laws of 2019, item 1374) and the agreed International Maritime Organisation (IMO) norms, standards and recommended methods of conduct binding on the Republic of Poland.

The objective of the investigation of a marine accident or incident under the above-mentioned Act is to ascertain its causes and circumstances to prevent future accidents and incidents and improve the state of marine safety.

The State Marine Accident Investigation Commission does not determine liability nor apportion blame to persons involved in the marine casualty or incident.

The following report shall be inadmissible in any judicial or other proceedings whose purpose is to attribute blame or liability for the accident referred to in the report (Art. 40.2 of the State Marine Accident Investigation Commission Act).

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1. Facts

On 30 April 2023, an able-bodied seaman suffered a work-related accident on board the Petro Giant drilling ship (hereinafter also called as a platform or rig) anchored on the Baltic Sea, at around 11:15 LT, while replacing the hook block¹ (*SWL* 27 T^2), for a smaller one (*SWL* 15 T), of crane No. 1 located on the geophysical deck.



Photo 1. Hook block (SWL 27 T) on the platform's geophysical deck

While working on the hook block, he suffered crushed fingers of his left hand as a result of the hook block tilting and the fingers of his left hand becoming jammed between the hoisting wire (also called a rener)³ and the sheave of the hook block with the casing. After the accident, the injured person was given first aid in the ambulatory by the platform doctor.

¹ A hook block is a device used for hoisting a load using a single or multiple shaves system. The main components of the hook block are sheaves with plain (sliding friction) or rolling (anti-friction) bearings and a turnable hook with a crossbar.

² SWL – Safe Working Load

³ Rener – steel wire (hoisting one) of the ship's crane to which the hook block is connected.





At 11:30 LT, the MRCC⁴ Gdynia was notified of a need for the medical evacuation of an injured A/B from the Petro Giant drilling ship.

At 12:44 LT the injured A/B was taken from the platform by a search and rescue helicopter from the Gdynia Babie Doły Naval Air Base and transported to the Naval Hospital in Gdańsk-Oliwa. At the hospital, after examination and finding the injuries sustained, two fingers of his left hand were partially amputated. After leaving the hospital A/B was on sick leave for four months. It was necessary due to further treatment and rehabilitation following the accident.

2. General information

2.1. Ship particulars

Ship's name:	Petro Giant	
Flag:	Polish	
Operator:	Lotos Petrobaltic S.A. Gdańsk, Poland	
Classification society:	PRS (Polish Register of Shipping S.A.)	
Type of the ship:	drilling ship (self - elevating drilling unit	
	not self – propelled)	
Call sign:	SPLC	
IMO number:	8415768	
GT:	16425	
Year and place of build:	1986 Hitaschi Zosen Yard, Ariake, Japan	
Engine power:	w/out engine	
LOA:	80.64 m	
Hull material:	steel	
Minimum safe manning:	5	
Crew details (number, nationality):	44 persons of Polish nationality (drilling	
	service – 16, maritime service – 11,	
	energy-mechanical service - 10, hotel	
	service – 7)	

⁴ MRCC – Maritime Rescue Coordination Centre







Photo 2. Petro Giant drilling ship

2.2. Voyage details

A platform anchored in the Baltic Sea in operational condition performing well drilling and reconstruction work⁵.

⁵ Well reconstruction work consists of replacing the downhole pump by a new pumping set in a well caved with a remotely operated subsea head. The reconstruction work is accompanied by subsea work at a depth of approximately 75 m.





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Photo 3. Position of the Petro Giant drilling ship on the Baltic Sea during an accident taken from EMSA SEG system.

2.3. Marine casualty or incident information

Type of accident:	marine casualty
Date and time of the accident:	30.04.2023 at 11:15 hrs
Position at the time of the accident:	$\phi=55^{\circ}27,58$ 'N $\lambda=018^{\circ}09,51$ 'E
Area of the accident:	Baltic Sea
Nature of the basin:	exclusive economic zone (EEZ)
Weather at the time of the accident:	wind S 6° B, sea 3-4, air temp. 12°C, visibility
	good
Consequences of the casualty:	crushed fingers of the left hand, two fingers
	partially amputated in hospital as a result of the
	sustained injuries.

2.4. Shore Services and Search & Rescue Action Information

Actors involved:a helicopter from the naval air base – evacuated an
injured A/B from the oil platform and transported
him to the Naval Hospital in Gdańsk-Oliwa.

SAR ship 'Bryza' from Władysławowo – participated in the rescue operation as a safety support from the sea for the rescuers from the helicopter.

3. Circumstances of the accident

The 'Petro Giant' drilling ship is a mobile offshore drilling unit (oil platform) designed to carry out reconstruction and drilling work on the Baltic Sea deposits. The platform can drill wells up to a depth of 7620 m. On 30 April 2023 at 07:00 LT, an able-bodied seaman (A/B) started work on board the rig along with other two deck crew. Based on order received from a boatswain, he performed transhipment work to receive cargo and personnel from the supply ship 'Basalt II'. For the handling activities, used the platform's crane No. 1. At first, transport of people and cargo from the ship to the platform took place using a small hook (SWL 15 T) and then, after changing the small hook to a hook block (SWL 27 T), the transshipment work continued. When the loading and unloading work had been completed, at around 11:00 LT, the platform boatswain gave an order to change the 27 T hook block back to a 15 T hook, as after the lunch break remaining handling operations required the use of a small hook. The injured A/B proceeded to change the 27 T hook block along with three other crew, with whom he had been working since the morning. They were an ordinary seaman (O/S), another able-bodied seaman (A/B 1) and a crane operator. The hook block change operation took place on the platform's geophysical deck and consisted of rearming (changing) the 27 T hook block on crane No. 1 to a 15 T hook.

Photo 4. Hook block change location on the geophysical deck of the Petro Giant drilling ship.

Figure 1. Rig workers (three seafarers) during a hook block change – reconstruction of the accident.

While the 27 T hook block was being lowered to the geophysical deck, one of the seamen communicated with the crane operator using the VHF radio (walkie-talkie)⁶ giving him instructions on how to position the crane arm until the hook block was set on deck. Once the hook block was positioned on the geophysical deck, the crane arm was lowered more so that the rener wire got slack, allowing the three stud bolts (pins) on the hook block to be freely removed. This was necessary to disconnect the end of the rener wire finished by a thimble⁷ from the hook block housing.

⁶ *VHF* – radio communication device

⁷ Thimble – an eye-shaped element at the end of a steel wire allowing to attach the end of the wire rope to fixed points and protecting it against abrasion and crushing.

Figure 2. Demountable stud bolts (pins) on the hook block to be removed by an A/B.

The injured A/B began to dismantle the stud bolts (pins) on deck after the hook block was positioned. It was necessary to dismantle the pins so that the thimble at the end of the rener wire would be able to pass through the sheave inside the hook block housing. At around 11:15 LT, while holding the rener wire with his left hand, between the sheave and the wire, he started to push the rener wire out of the hook block. At this time, the crane operator was probably still picking up slack on the rener. At one point, the hook block tilted due to a loss of balance, causing the A/B fingers to be jammed and crushed. A/B 1 when he heard a loud cry from the casualty immediately gave via VHF radio to the crane operator the command 'stop' to halt the movement of the rener wire. O/S and A/B 1 attempted to free the injured man's stuck hand between the sheave and the rener wire, but these actions were unsuccessful. A boatswain was immediately called to assist. The boatswain used wooden beams, which he placed under the 'cheek' of the hook block, and gave a signal to the crane operator to slack the rener wire. This reduced its pressure on the casualty's hand and allowed it to be freed. Once the casualty's hand was freed, he was taken to the platform's ambulatory where the platform doctor administered first aid. A/B was fitted with a dressing and given pain relief.

At 11:30 LT a SAR rescue helicopter was called in, which landed on the platform's helipad at 12:40 LT and picked up the injured man. At 13:25 LT the injured A/B was transferred to the Naval Hospital in Gdańsk-Oliwa. At the hospital, necessary examinations were carried out and

two fingers of A/B's left hand were partially amputated. The injured man was on sick leave for 4 months from the day he was discharged from hospital and during this time he underwent rehabilitation of his left hand injured fingers.

4. Analysis and comments about factors causing the marine casualty with regard to results of investigation and expert opinions.

The Petro Giant drilling ship is registered as a seagoing ship and at the date of the accident had all valid ship certificates and the International Standard for the Management and Operation of Ships and for Pollution Prevention, known as the ISM Code, in place. The drilling platform 'Petro Giant' was carrying out geological and drilling work and was operating under the provisions of the Geological and Mining Law.

The crew on the rig consists of four services:

- the drilling service, possessing geological and mining qualifications,

- the energy-mechanical service, certain individuals of which, depending on their position, held geological and mining qualifications and maritime qualifications and certificates,

- the maritime service, whose crew held maritime qualifications and certificates,

- the hotel service - which held basic maritime qualifications and certificates.

The Platform Manager (PM) has a one-person management function on the platform, and it is his/her responsibility to direct the overall operations of the platform. The Platform Manager is subordinated by the Deputy Platform Manager for Maritime Affairs (DPM), who performs the function (position) of the Captain (Master) on board the platform and who, at the time of the accident, had the appropriate authority and competence, as required by the relevant maritime legislation and the shipowner's internal regulations. He/she has the authority to command and direct all maritime work and operations. He/she directs the work of the deck team and, in particular, is in charge of and commands all the handling work on the platform.

As a result of the investigation, the Commission found that the immediate cause of the A/B's work-related accident while replacing the hook block was the uncontrolled tilting of an unsecured on the rig's deck hook block while it was being replaced. When the able-bodied seaman pulled back the rener wire with his left hand, the hook block (weighing 1,200 kg) became unstable and tilted, causing A/B's hand to become trapped between the rener wire and the hook block housing. This led to the crushing of the fingers of the A/B's left hand.

The injured A/B belonged to the platform's maritime service and his immediate supervisor was a boatswain, who gave the order to change the hook block on the day of the accident. The accident at work on the 'Petro Giant' platform with a 27 T hook block was not related to a malfunction of the crane or the hook block. The platform crane No. 1 and the hook block were in good working condition and the equipment had all the required certificates and inspections (annual and five-yearly) in accordance with the regulations of the classification society – the Polish Register of Shipping (PRS).

4.1. Mechanical factors

In the Commission's view, the mechanical factor that directly contributed to the accident was the uncontrolled tilting of the unsecured heavy hook block when the A/B's left hand was between the rener wire and the sheave of the hook block. This resulted in his hand being pulled in, jammed and the fingers of his left hand being crushed. In addition, the size and shape of the block and the small area of its base were factors contributing to the loss of the block's stability and its tilting. This made the hook block unstable on the uneven platform deck.

Photo 5. Hook block set up on the platform's geophysical deck.

4.2. Human factors

The Commission considered that it was a serious A/B's mistake to perform the replacement of a hook block that was unprotected against loss of stability or displacement/tilting. In addition, the operator of crane No. 1 was unable to see the hook block or the geophysical deck from the crane cab when setting the hook block on the geophysical deck. This area was out of his line of sight and the range of the CCTV⁸ cameras mounted on the crane.

⁸ CCTV – Closed Circuit TeleVision

Photo 6. View from the operator's cab during the lining up the arm of the crane No. 1 when changing the hook block.

The injured able-bodied seaman working on the hook block failed to ensure and inform the crane operator that he had started to remove the stud bolts. He did not have a VHF radio to communicate and exchange information directly with the crane operator. It should be noted that the injured A/B had all the relevant professional qualifications and the necessary training and certificates entitling him to work on board sea-going ships and drilling platforms as an A/B, as required by the flag state and the STCW Convention⁹. He had many years' experience of working on merchant ships as an A/B as well as a boatswain, and had several years' experience of working on oil rigs at Lotos Petrobaltic S.A. He had been working on board the 'Petro Giant' drilling ship since October 2022 in a rotation of two weeks on board the rig and two weeks resting at home on shore. At the time of the accident, he was wearing the appropriate and required work clothing and the necessary personal protective equipment:

⁹ STCW – International Convention on Standards of Training, Certification and Watchkeeping for Seafarers.

clothes/overall, safety shoes, gloves, goggles and a safety helmet. He had a valid health certificate, complied with seafarers' medical examinations as required by the STCW Convention and OHS training. On the platform he was working in the marine section as a dayman¹⁰. The day of the accident was his third day of work on the platform after a period of rest at home, so at the time of the accident there was no human factor in the form of fatigue.

4.3. Organisational factors

On the date of the accident, the Petro Giant drilling ship had an International Safety Management System in place, confirmed by an ISM Certificate issued by the Director of the Maritime Office in Gdynia. Despite having a management system in place for the safe operation of the ship, the Commission noted that the rig lacked procedures or instructions for preparing risk assessments for unusual or non-routine work and lacked detailed guidelines to include conducting a Toolbox Talk. The ISM Code¹¹ requires the shipowner, in terms of safety management, to establish instructions and procedures for an appropriate and sufficient assessment of risks to the health and safety of workers. This assessment of hazards assists the shipowner in identifying them and establishing safe practices to protect workers.

Such instructions on ships are created in the form of risk assessment lists of unusual or nonroutine work to identify hazards. Currently, shipowners prepare lists (library) of risk assessments for non-routine and unusual work performed on ships by the crew after approval by the responsible person. The risk assessments of such work are then published in the Safety Management System. When planning to carry out a specific work or task, the crew reviews the risk assessment database and uses the information contained therein to carry out a risk assessment of the work or task. These take into account health and safety hazards in the workplace and indicate appropriate measures to be taken to remove or minimise the hazards present. For risk assessment, shipowners use a so-called risk assessment matrix – see figure below.

¹⁰ dayman – daytime worker.

¹¹ ISM Code – International Safety Management Code

Figure 3. Risk assessment matrix (sheet).

When the hazards (risks) are in the red areas, an action plan should be developed to eliminate or reduce these risks, i.e., move them on the matrix to the green/yellow boxes.

There was no such form of risk assessment for the task of replacing the 27 T hook block on the platform.

The Commission considered that an organisational factor that contributed to the accident was the lack of assessment of the risk of loss of stability and tilting of the hook block. The A/B had previously performed the operation of changing the 27 T hook block and had been trained by the boatswain on how to perform this task but had not been informed of the specific risks and mechanical hazards to be considered when working with the hook block, which included possible consequences such as: crushing, impact, hand entrapment. The lack of adequate shipowner's procedures and instructions for safe work when changing hook blocks on cranes operated on an oil rig resulted in work on the hook block being performed without sufficient knowledge as recommended in the hook block manufacturer's instructions. The instructions for operating the crane as well as changing the hook block were in English, which may have been a difficulty in learning its useful guidelines on how to properly secure the hook block against loss of stability or overturning. There was no information on the hazards in the 'Occupational Risk Information' for the position of able-bodied seaman/ordinary seaman, for hook block work and the preparation of an occupational safety analysis with risk assessment as preventive measures to reduce occupational risks.

4.4. The influence of external factors, including those related to the marine environment, on the occurrence of the accident.

An external factor that may have influenced the unstable behaviour and tilting of the hook block was the wind blowing at 12 m/s or about 6°B on that day. The force of the blowing wind, may have had an adverse effect on the stability behaviour of the hook block when the rener wire was pulled back during the removal of the stud bolts by injured A/B.

5. Description of Examination Findings Including the Identification of Safety Issues and Conclusions

The Petro Giant drilling ship, as a seagoing ship, has an ISM Code in place. The Commission notes that the safety management system on board the platform lacked instructions and procedures for conducting risk and hazard assessments for both non-routine and unusual work.

The Commission notes that the crew members on board the platform were not familiar with the instructions for operating the hook block, as well as with the fact that its proper replacement require to use a special basket.

The hook block was not secured against tilting or falling during its replacement. The base of the hook block has a small footprint and is vulnerable to tilting or falling when working on the hook block due to e.g., pulling back the rener wire, unevenness of the deck and adverse weather conditions (strong winds). The crane instruction manual, in the section concerning the hook block, recommends using a basket as safety equipment to protect against falling or tilting. The crane's technical manual was in English and may not have been fully understood by the crew.

Figure 4. Basket for a hook block recommended by the manufacturer.

6. Safety recommendations

According to statistics, including those kept by the EMSA¹², a total of 6,155 injuries were reported in 5,394 marine casualties, accidents and incidents between 2014 and 2021. Between 2014 and 2019, the average number of injuries was 825, with a decrease to 587 in 2020 and again an increase to 621 in 2021, which is 25.8% less injuries than in 2019. 84.6% of the injuries were to ship's crew members (graph below).

¹² EMSA – European Maritime Safety Agency.

Figure 5. Graph – summary of accidents and injuries to ship crews 2014-2021.

Given the above summary of accidents and injuries to seafarers, shipowners and crews should make every effort to ensure that such events will not occur.

By the time the report was prepared, the owner of the Petro Giant drilling ship had determined the causes and circumstances of the accident and prepared recommendations for the rig crew on the basis of the PIP's¹³ post-inspection recommendations, which include:

1. Training of the employees of the drilling platforms managed by the Lotos Petrobaltic S.A. on the circumstances and causes of the accident, paying particular attention to the hazards occurring during work with hook blocks so that similar events will not occur in the future.

2. Installation of an additional CCTV camera on the crane arm to enable the crane operator to observe the working area of the crane during hook block replacement operations on the platform deck.

3. Translation of the crane's TM¹⁴ from English into Polish, which is the working language on the Petro Giant drilling ship.

4. Conducting additional periodic training of workers of platforms managed by Lotos Petrobaltic S.A on OHS issues, including a detailed discussion of the hook block accident that occurred on board the Petro Giant drilling ship. The State Marine Accident Investigation Commission, taking into account the actions taken by the owner of the Petro Giant drilling

¹³ PIP – State Labour Inspection (*Państwowa Inspekcja Pracy*).

¹⁴ TM – Technical Manual

ship after the accident and the implementation of the PIP's post-accident recommendations, waived to make safety recommendations before issuing this report.

To improve the level of safety, the Commission recommends to the owner of the Petro Giant drilling ship to review the Safety Management System in place at Lotos Petrobaltic S.A. and proposes to consider the introduction of risk controls for routine and non-routine work, together with the development of a risk assessment system for this work.

In addition, the Commission recommends following the crane manufacturer's recommendation to place the hook block in a basket when working on it, to properly prevent it from losing stability and tilting.

7. Information sources

Notification of the accident.

Materials and documents received from the shipowner

Ship documents (mobile offshore drilling unit/drilling ship)

Hearing of the injured A/B

Inspection protocol and documents received from the District Inspectorate of the State Labour Inspection in Gdańsk (National Section of Maritime and Inland Navigation)

8. List of photos

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Team leader – Tadeusz Gontarek – Member of the Commission.

Team member – Marek Szymankiewicz – Secretary of the Commission.