

Report on the investigation into  
a serious injury  
on board LNG tanker **SUMMIT LNG**



in the Bay of Bengal  
with a deep cut on the left leg  
on November 24<sup>th</sup>, 2020.



## Extract from European Directive 2009/18

(26) Since the aim of the technical safety investigation is the prevention of marine casualties and incidents, the conclusions and the safety recommendations should in no circumstances determine liability or apportion blame.

In view of the COVID-19 pandemic in 2020, and local rules and regulations to prevent the further spread of the virus, the investigators of the Federal Bureau for the Investigation of Maritime Accidents adhered to all legislation in vigour, which might have hampered certain investigative acts. Nevertheless, no efforts were spared to conduct the investigation, into the cause of the marine accident mentioned in this report, to the largest possible extent and conclusions were only drawn after very large consideration.

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### 3. GLOSSARY OF ABBREVIATIONS AND ACRONYMS

cm	Centimetres
E	East
FSRU	Floating Storage and Regasification Unit
IMO	International Maritime Organization
kW	KiloWatt
LLC	Limited Liability Company
LNG	Liquified Natural Gas
m	Metres
mt	Metric Tons
M/v	Motor Vessel
N	North
N°	Number
PPE	Personal Protective Equipment
UTC	Universal Time Coordinated

## **4. MARINE CASUALTY INFORMATION**

### **4.1. RESUME**

*Throughout this report all times are in Local Time, UTC+6, unless specified.*

On November 24<sup>th</sup>, 2020 at 11:20 hours, a crewmember on board the Belgian flagged floating storage and regasification unit SUMMIT LNG was seriously injured at the calf of his left leg. During dismantling of the auxiliary generator, the engineer stood on top of the generator and he wanted to step from the generator onto the adjacent platform.

With one foot on the platform and holding the handrail, he slipped, and the calf of his left leg grazed against the edge of the angle bar that supported the exhaust manifold.

The edge of the angle bar caused a 15 cm long cut, approximately 3 to 5 cm deep.

After first aid was given in the ship's hospital, the victim was taken to a hospital ashore for further treatment.

### **4.2. CLASSIFICATION OF ACCIDENT**

According to Resolution A.849(20) of the IMO Assembly of November 27<sup>th</sup>, 1997, Code for the investigation of Marine Casualties and Incidents, a marine casualty means an event that has resulted in any of the following:

- the death of, or serious injury to, a person that is caused by, or in connection with, the operations of a ship; or
- the loss of a person from a ship that is caused by, or in connection with, the operations of a ship; or
- the loss, presumed loss or abandonment of a ship; or
- material damage to a ship; or
- the stranding or disabling of a ship, or the involvement of a ship in a collision; or
- material damage being caused by, or in connection with, the operation of a ship; or
- damage to the environment brought about by the damage of a ship or ships being caused by, or in connection with, the operations of a ship or ships.

A serious injury means an injury which is sustained by a person in a casualty resulting in incapacitation for more than 72 hours commencing within seven days from the date of injury. Consequentially, the incident was classified as a

### ***MARINE CASUALTY - SERIOUS INJURY***



### 4.3. ACCIDENT DETAILS

Time and date	November 24 <sup>th</sup> , 2020, 11:20 hours LT, UTC+6
Location	21° 53' N 091° 49' E Summit LNG terminal, offshore Moheshkhali Island in the Bay of Bengal, Bangladesh
Persons on board	34
Injured	1
Deceased	none

## 5. SYNOPSIS

### 5.1. NARRATIVE

The Belgian flagged LNG tanker SUMMIT LNG is a Floating Storage and Regasification Unit, or FSRU, owned by Excelerate Energy.

In August 2017, Summit Power International entered into a 15-year charter agreement with Excelerate for the exploitation of FSRU SUMMIT LNG.

Operations began in April 2019 when the vessel arrived at Summit LNG Terminal, offshore Moheshkhali Island in the Bay of Bengal, Bangladesh, as indicated in Figure 1 - Location of Summit LNG terminal.



Figure 1 - Location of Summit LNG terminal

Picture: [excelerateenergy.com](http://excelerateenergy.com)

The FSRU distributed regasified LNG via a subsea pipeline connected to the national grid of Bangladesh.

The vessel remained in the same position since April 2019.

In February 2020, the auxiliary diesel generator went out of order. After service engineers had boarded the vessel and inspections had been carried out, it was decided that the crankshaft had to be replaced. The diesel generator had to be dismantled to access the crankshaft.

On November 23<sup>rd</sup>, at 18:00 hours, a daily work meeting was conducted and documented. Approximately 80 % of the dismantling job as shown in Figure 2 had been done.



*Figure 2 - Dismantling of auxiliary generator in progress*

On November 24<sup>th</sup> at 07:45 hours, the working day started with a work site inspection carried out and documented by a supervising engineer.

At 08:00 hours, the work permit was presented to the Master for approval, but he refused to sign it as the task risk analysis had not been completed.

At 08:20 hours another supervising engineer inspected the work site and documented the inspection.

Ten minutes later, the Master and chief engineer authorised the “permit to work” document for works on the auxiliary engine.

Meanwhile, a toolbox talk was held, documented and signed by the three engineers assigned to the dismantling of the auxiliary generator that day.

At 09:00 hours the permit to work for dismantling the auxiliary generator became valid.

A workplace inspection was carried out and the work commenced at 09:50 hours.

At 11:20 hours, one of the engineers involved in the works was standing on top of the generator, as seen in Figure 3. He was wearing the PPE as shown in the picture. His coverall was a so called tropical coverall, made of a light cloth and designed for working in hot areas.



*Figure 3 - Engineer standing on top of the auxiliary generator  
Reconstruction photograph*

Adjacent to the generator top at the same height, there was a walking platform. Between the generator and the platform was a gap of approximately 40 cm, as shown in Figure 4.



*Figure 4 - Front view and top view of generator and platform*

*The platform was accessible from below by a vertical ladder. Please note the handrails on the left side and the right side of the ladder, as shown in the left picture.*



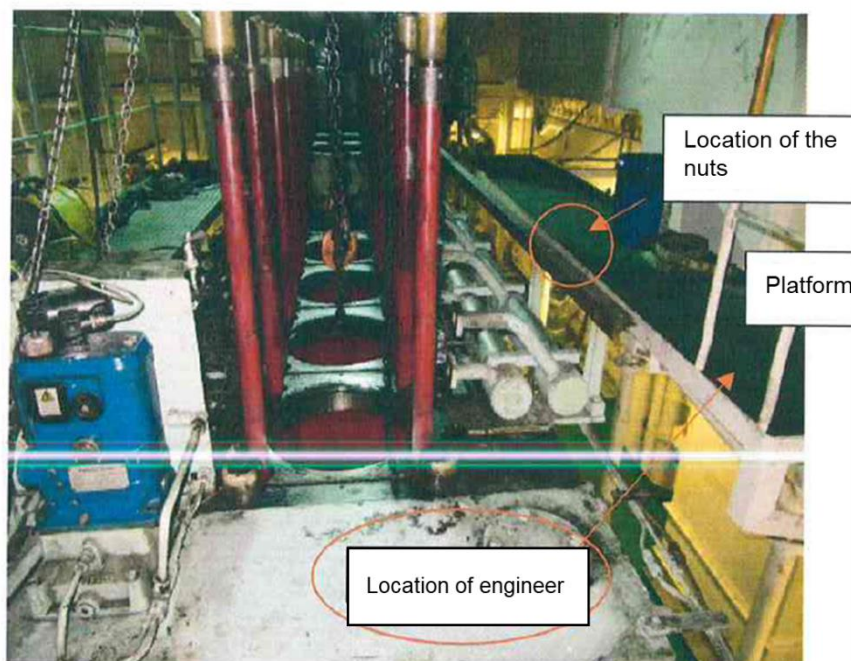
Between the generator and the platform, an angle bar that supported the exhaust manifold was placed.

The angle bar was positioned 30 cm higher than the generator top and the platform, as seen in Figure 5.



*Figure 5 - Angle bar that supported the exhaust*

The engineer needed nuts that were lying on the platform, but they were out of his reach. He had to step onto the platform. Figure 6 shows the location and the position of the nuts.



*Figure 6 - Overview of work location*

The engineer held the vertical stud bar with his right hand and stepped with his right foot on the platform. His left foot was still standing on top of the generator. His left leg came close to the edge of the angle bar. Figure 7 shows a reconstruction of this movement.



*Figure 7 - Reconstruction of the movement of the engineer*

When the engineer wanted to step onto the platform with his other foot, he slipped and fell forward on the platform, as shown in Figure 8. His left leg braced against the edge of the angle bar.



*Figure 8 – Reconstruction of fallen engineer*

An engineer working together with the victim helped the victim on the platform and assisted the victim to the ship's hospital.

Around 11:25 hours, the injured engineer arrived at the ship's hospital for examination by the medical officer.

A 15 cm long cut of 3 to 5 cm deep was observed on the calf of his left leg.

At 11:30 hours, the medical officer informed the Master about the incident.

At 11:31 hours the Master assessed the injury and decided to require medical assistance.

The wound was disinfected and wrapped with a sterile gauze. The victim was given a pain killer to relieve the pain.

At 11:35 hours tug PSA - 5 was tasked for the medical disembarkation of the engineer.

The ETA of the tug was 12:30 hours.

Between 11:40 hours and 12:05 hours, the company and the agent were informed about the incident.

At 12:27 hours, an alcohol test was carried out and witnessed by the Master and the medical officer. The result of the test was negative.

At 12:40 hours, the engineer disembarked and was brought to the hospital.

The permit to work around the auxiliary engine was suspended for investigation from 13:00 hours to 14:30 hours.

At 15:00 hours a meeting regarding the accident was held on the vessel's bridge and attended by all crew.

The disembarked engineer arrived at the hospital at 17:37 hours.

A doctor examined the injured engineer at 18:07 hours.

November 25<sup>th</sup>, at 10:52 hours, the engineer reported that the doctor excluded any complication of the injury. Only tissue had been hit, the muscles and nerves were intact.

The engineer left the hospital on November 29<sup>th</sup>.

He was declared fit for duty again on December 15<sup>th</sup>.

## 6. FACTUAL INFORMATION

### 6.1. VESSEL'S DETAILS



*Figure 9 – SUMMIT LNG*

*Picture: summitpowerinternational.com*

Type	LNG Tanker/ Floating Storage and Regasification Unit
Flag	Belgium
Port of Registry	Antwerp
IMO N°	9322255
Call Sign	ONDY
Built	October 2006
Shipyard	DAEWOO SHIPBUILDING & MARINE ENGINEERING CO. LTD. GEOJE, SOUTH KOREA
Owner	Excellerate LLC
LOA	277m
Beam	43,4m
Summer DWT	77,263 mt
Gross Tonnage	93901
Capacity	135313m <sup>3</sup> Liquid Gas
Engine Power	26478 kW



## 7. ANALYSIS

The engineer had to step over a 40 cm gap.

The generator top and the walking platform were at the same height, but there was a small vertical edge to the walking platform.

To step over a gap of 40 cm, the distance between your feet should be approximately 60cm. An average step measures about 73 cm, including the length of one foot.

The step taken to get on the platform from the generator top was bigger than a normal step.

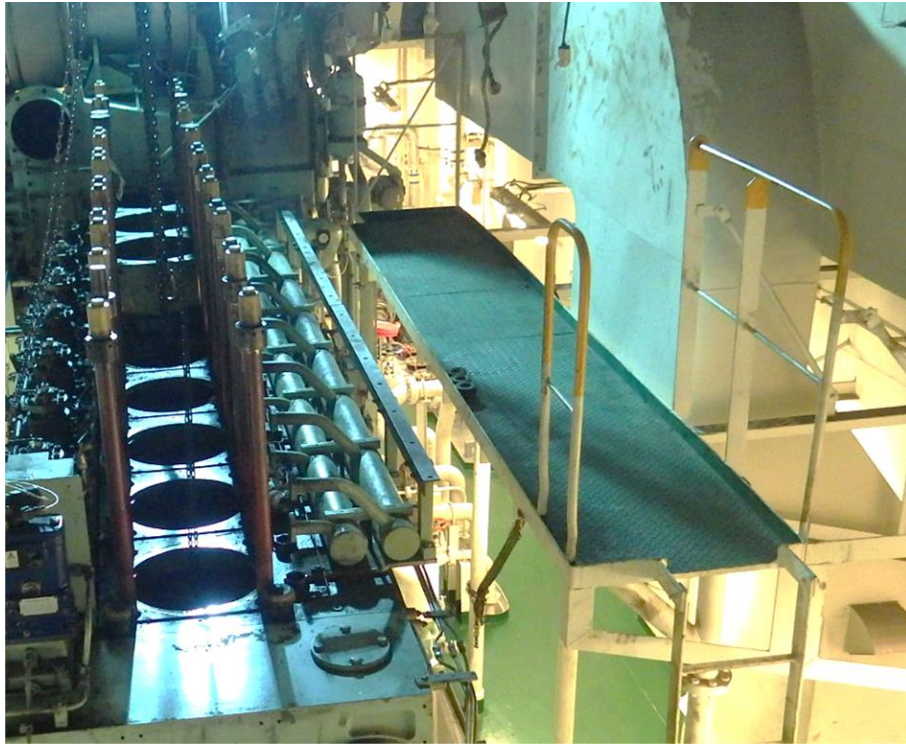
A vertical stud bar on the walking platform assisted the engineer in making this step.

The surfaces were regularly cleaned and the dirty rags were removed from the working area. The presence of traces of oil and/or grease could not be excluded.

Regular cleaning was part of the daily toolbox meeting.

The generator top and the platform did not have the same degree of traction. The generator top consisted of painted, smooth steel. The walking platform was consisted out of chequered plate.

The working area was lit by extra portable lights. The light in the working area was not equally spread. The light distribution was hindered by parts of the generator and hoisting gear, as indicated in Figure 10. The lighting could have influenced the engineer's judgement regarding the distance from his leg to the angle bar.



*Figure 10 - Light distribution in the working area*

The angle bar consisted out of steel and the edge was an unprotected right angle.

The coverall of the engineer was made of a light tissue, designed to wear in warm environments. This kind of tissue offers less cut resistance.

There was no indication that the engineer was in a hurry to get the nuts that were lying on the platform.

The job on the generator was part of the Daily Work Plan on board. The work plan was discussed on November 23<sup>rd</sup>.

The work permit was dated November 24<sup>th</sup> and properly signed by all parties. The work permit included a toolbox meeting to be held before commencement of the job.

A Toolbox Talk Card was properly filled and signed, dated November 24<sup>th</sup>.

A Task Risk Assessment was made on November 24<sup>th</sup>.

## **8. CAUSE OF THE ACCIDENT**

Most probably, the engineer slipped due to a combination of factors such as:

- The presence of traces of oil and/or grease;
- The difference in traction between both surfaces;
- The size of the step to get to the platform.

The unprotected edge of the angle bar and the type of tissue where the coverall was made of did aggravate the consequences of the fall and so contributed to the accident.

## **9. CONCLUSION**

### **9.1. ACTIONS TAKEN**

The company:

- Had started an internal investigation directly after the accident happened;
- Initiated a review of the company's "Control of work" training material with an emphasis on the risks recognition.

The vessel:

- Informed all crew members about the accident during a meeting;
- Suspended the dismantling of the generator until the onboard investigation was completed;
- Resumed the dismantling of the generator in December 2020 after submitting a risks analysis to the company prior approval by the Master.





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