

# Examples of HNS Accidents Handled by the Japan Coast Guard

**JAPAN COAST GUARD  
NATIONAL STRIKE TEAM**





# Yokohama Base of the National Strike Team

**The "SUN-VENUS", a ethanol tanker Explosion-and-burning-in-flames accident**



**December 24, 2003**

**The "Takasago 2", a LPG tanker Stranding accident**



**March 29, 2005**

**The "No. 2 Shokakumaru", a liquefied gas tanker Collision**

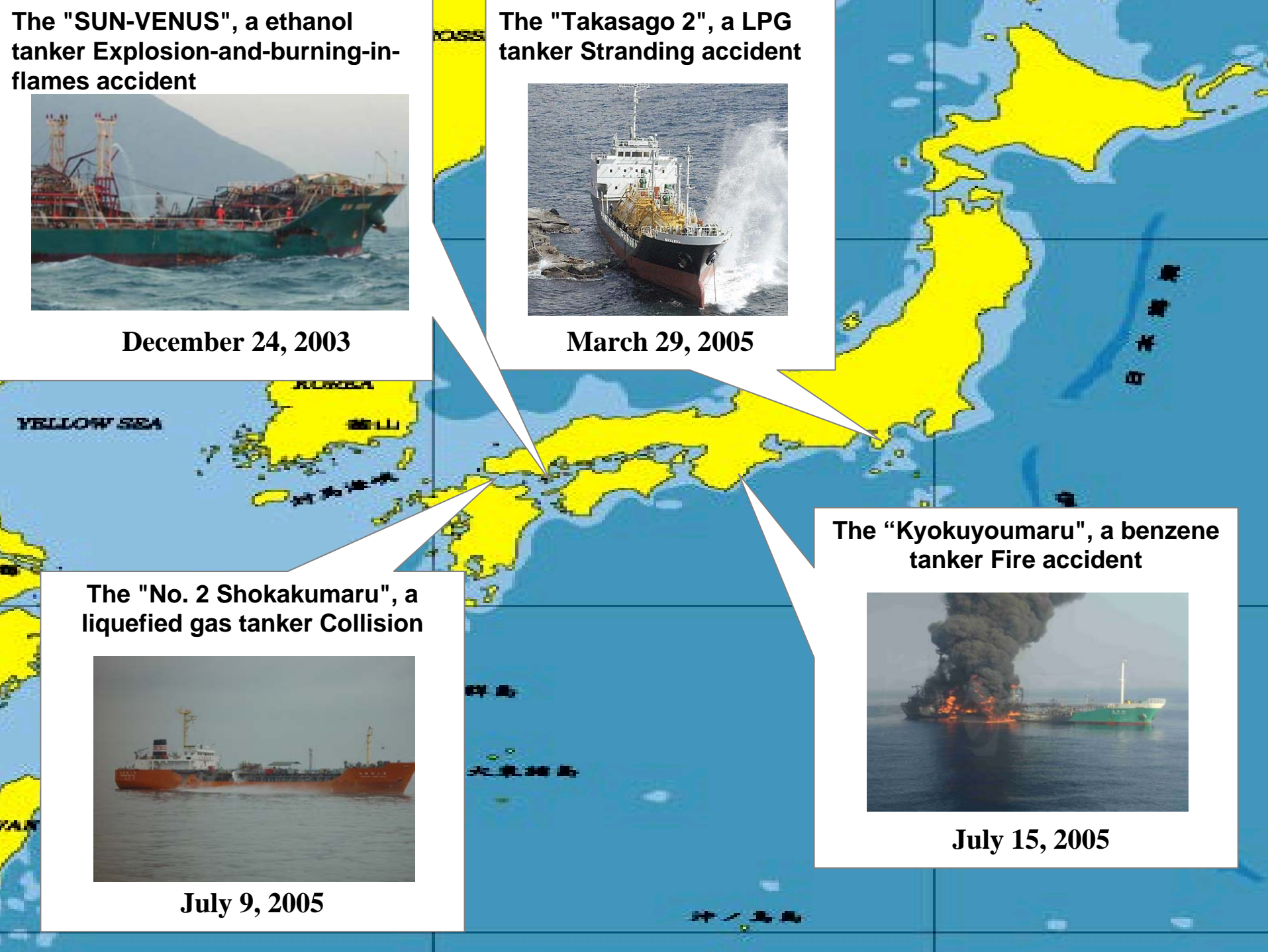


**July 9, 2005**

**The "Kyokuyoumaru", a benzene tanker Fire accident**



**July 15, 2005**



# Stranding Accident of the "Takasago 2", a LPG Tanker

Date and time of occurrence: 02:31, March 29, 2005

Scene of occurrence: the seashore of Higashi-Izu-Okawa,  
Shizuoka Prefecture

Ship's principal items:

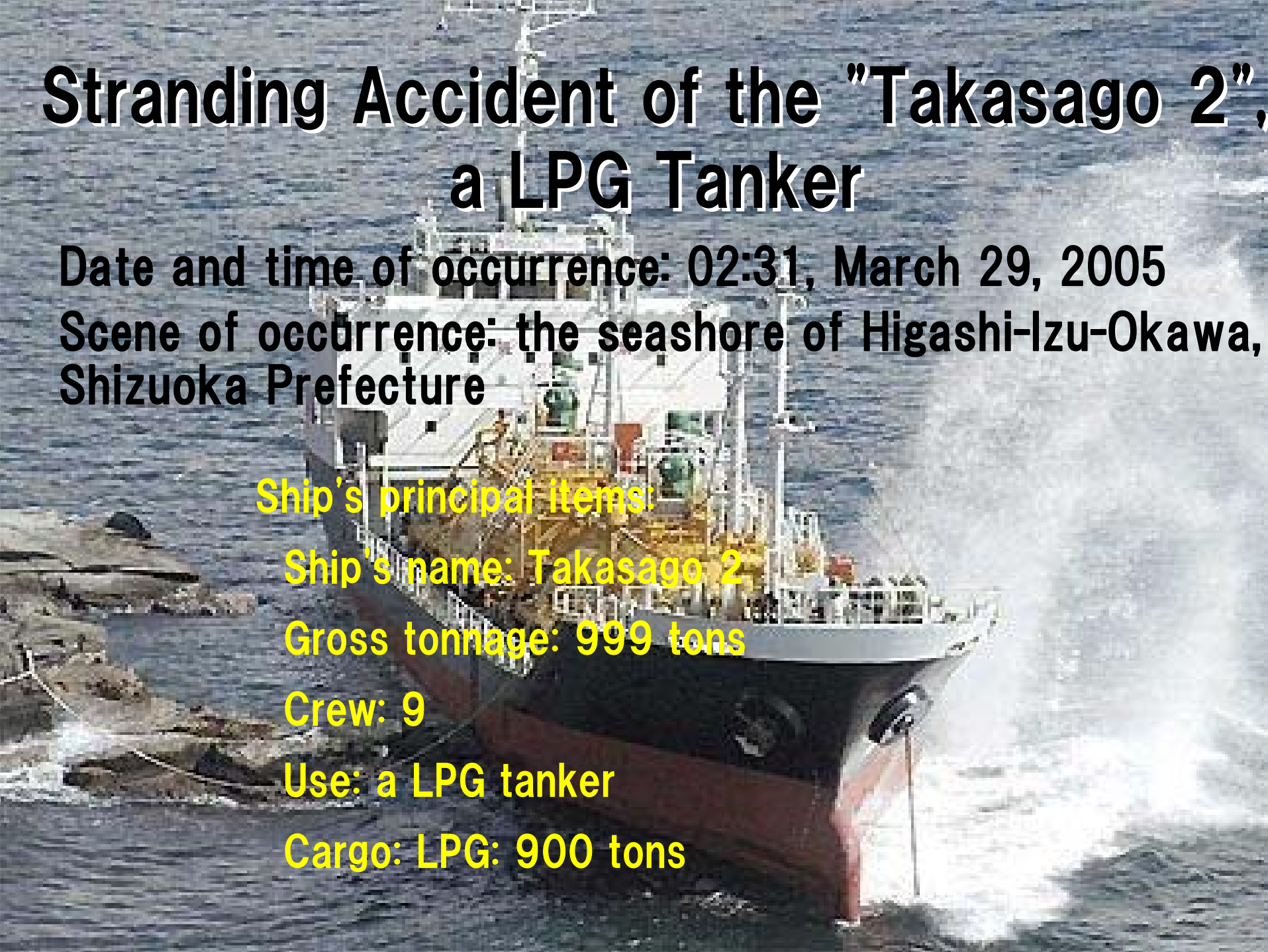
Ship's name: Takasago 2

Gross tonnage: 999 tons

Crew: 9

Use: a LPG tanker

Cargo: LPG: 900 tons



# Background Information

## 1 Site Environment

- Water Depth : 0.5 - 5 meter
- Sea condition: 1 meter of wave height and swell at all times

← Beauty spot  
"The Lion Rock"

## 2 Situation of the ship

- Flooded : the engine room and the water ballast tank
- Unavailability : the engine, the LPG transportation pump, etc

## 3 Opinion of the salver

- Impossible situation to tow and raise her because of stranding and flood
- Impossible task for a oil removal ship to alongside her due to shallows
- Impossible work to Pull her up due to the necessity for welding fittings
- No how to remove LPG from stranded LPG carrier at all

## 4 Opinion of Ship owner

- No trouble in the tank, and no danger of LPG leakage and the explosion
- The highest priority should be given to remove the oil and to tow the ship

# Properties of LPG (Propane)

## Data of physical properties:

Boiling point: about  $-42.1$  to  $-42.07^{\circ}\text{C}$

Vapor pressure:  $830\text{kpa}$  (at  $20^{\circ}\text{C}$ )

✕ Vapor pressure of water:  $23.3\text{kpa}$

Specific gravity:  $0.6$  Vapor density ratio:  $1.5 - 1.6$

Solubility: LPG dissolves in water to a slight degree.

## Data for fire fighting:

Flash point:  $-104^{\circ}\text{C}$

Range of explosion:  $2.2 - 9.5\text{Vol.}\%$

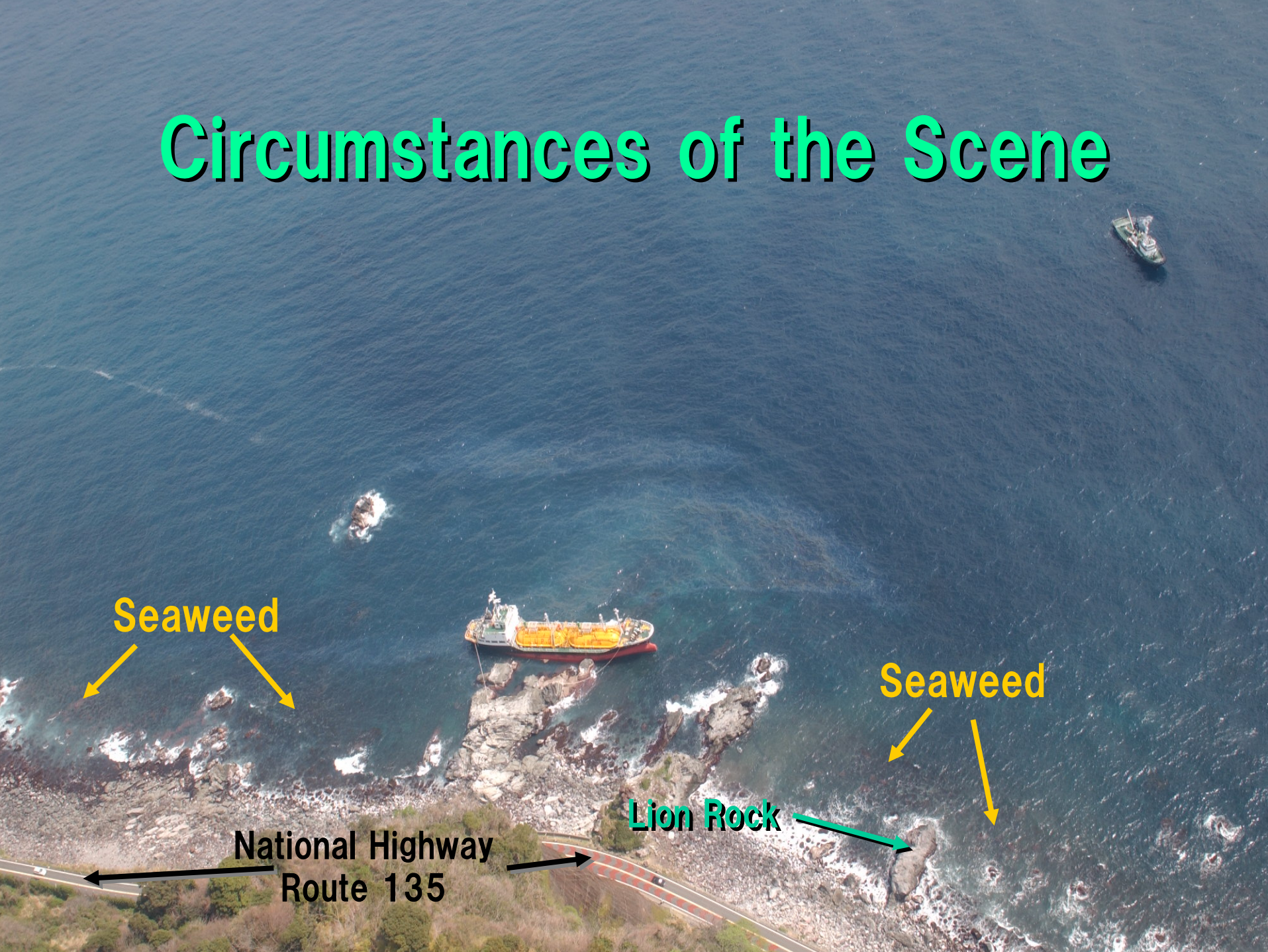
Ignition point:  $450 - 466^{\circ}\text{C}$

## Riskiness and noxiousness:

Highly concentrated LPG may be suffocative.

LPG mixed with air forms an explosive gas.

# Circumstances of the Scene



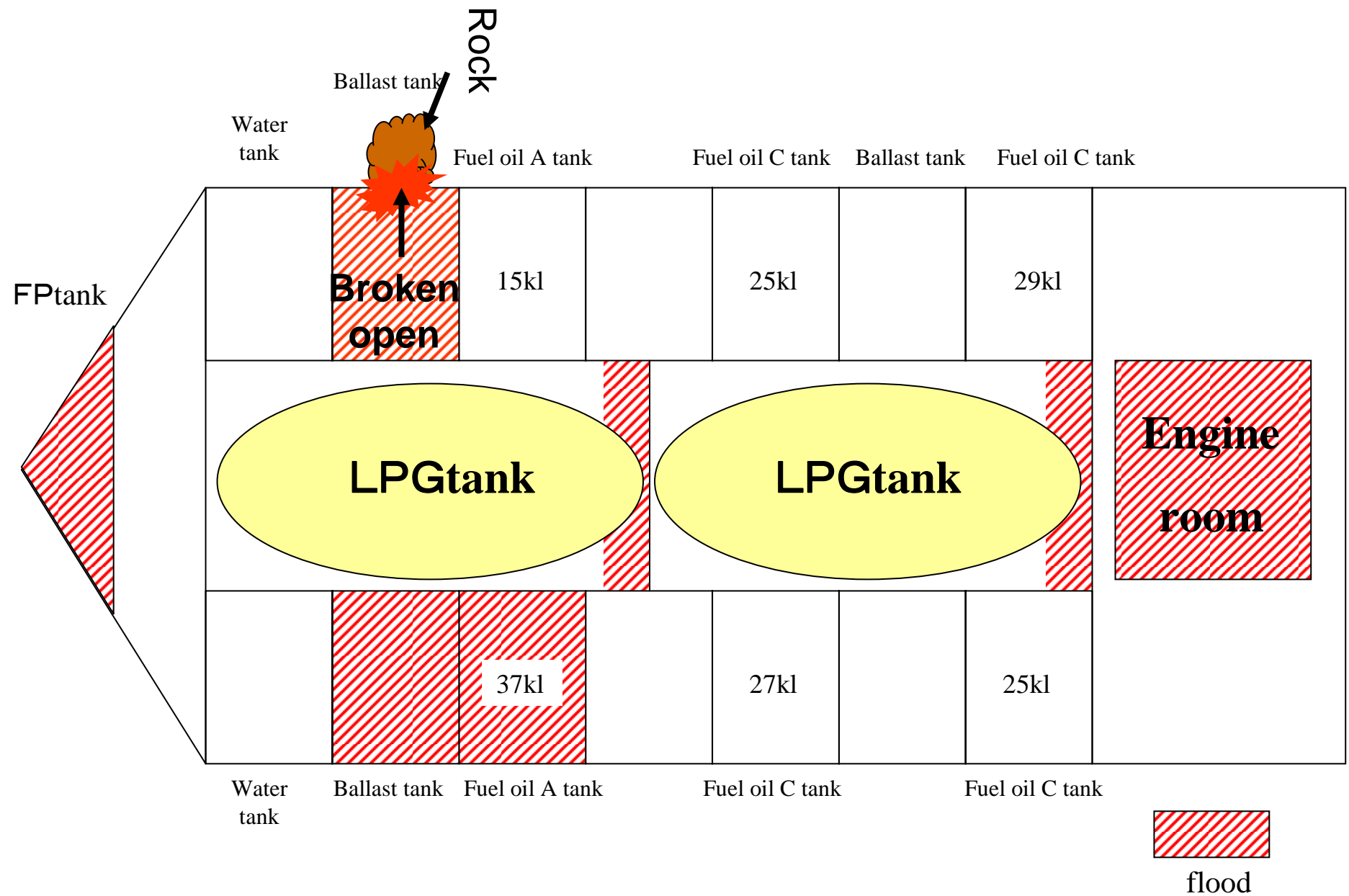
Seaweed

Seaweed

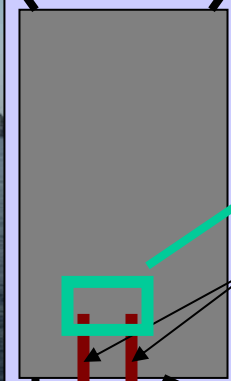
Lion Rock

National Highway  
Route 135

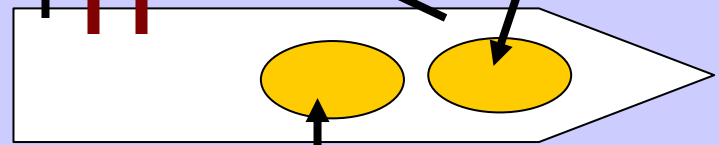
# Flood tank condition



# Residual Oil Extracting Technique



**Oil extracting line**



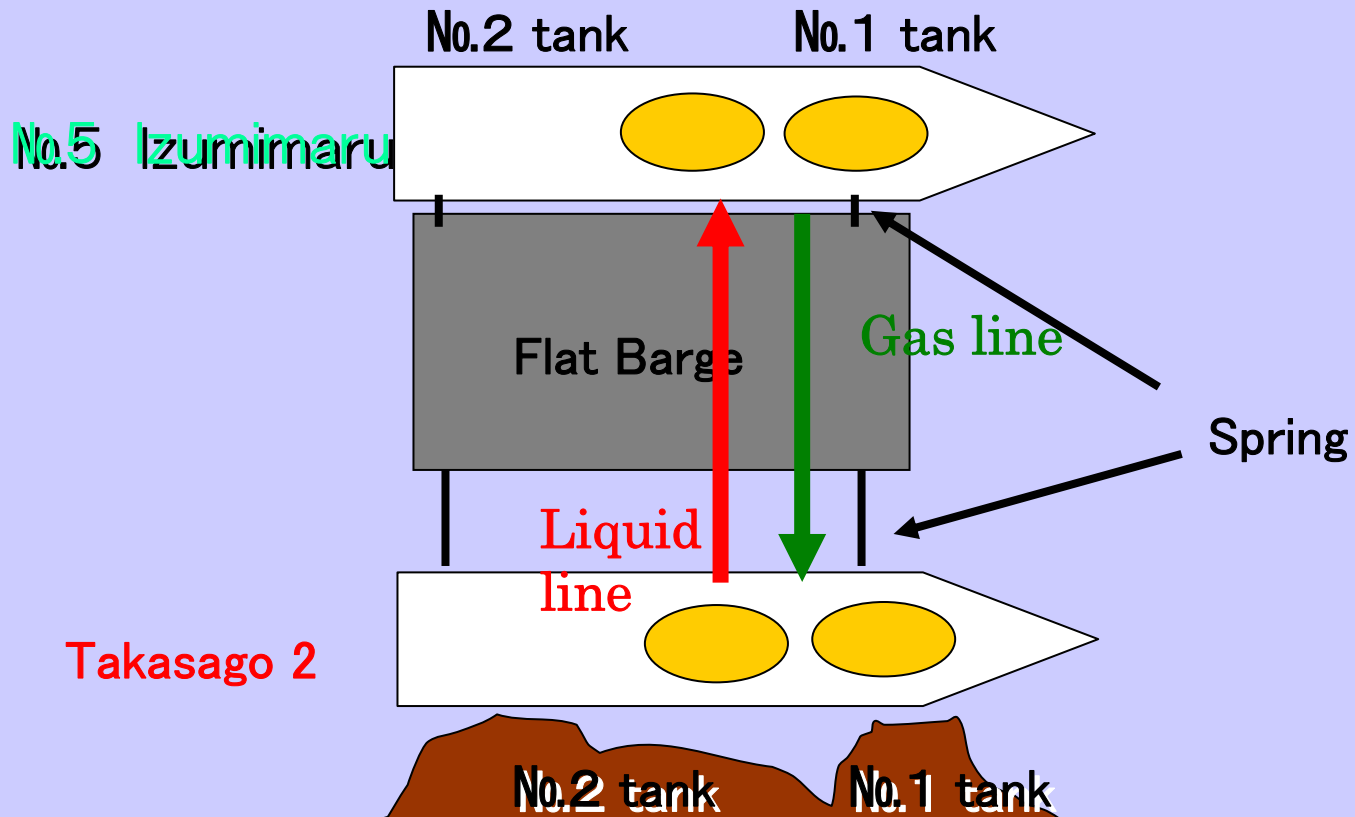
**No.1 tank**

**No.2 tank**

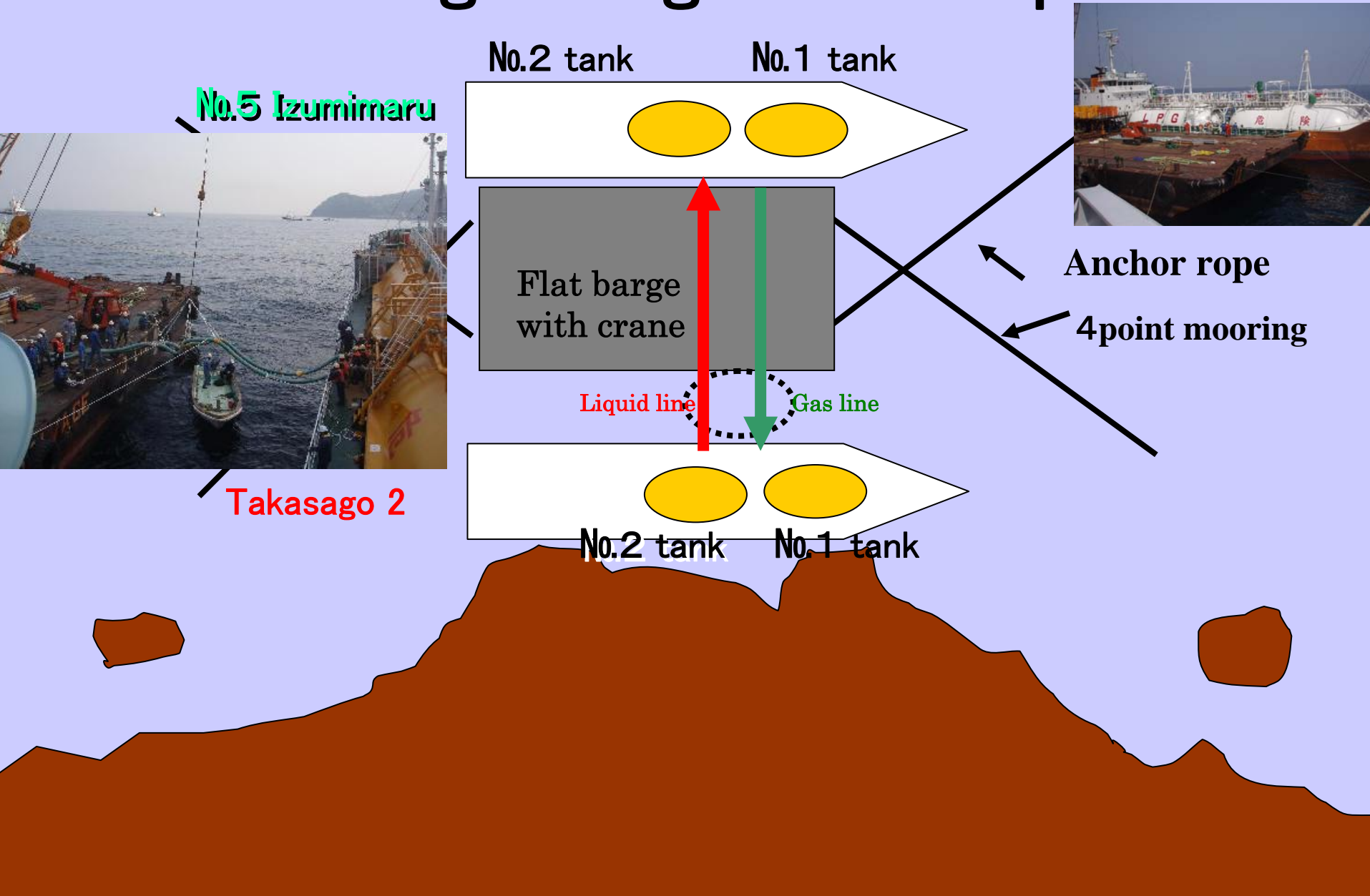
**The Takasago 2**

**Executed on March 30 and 31  
April 1, 2, 3 and 5**

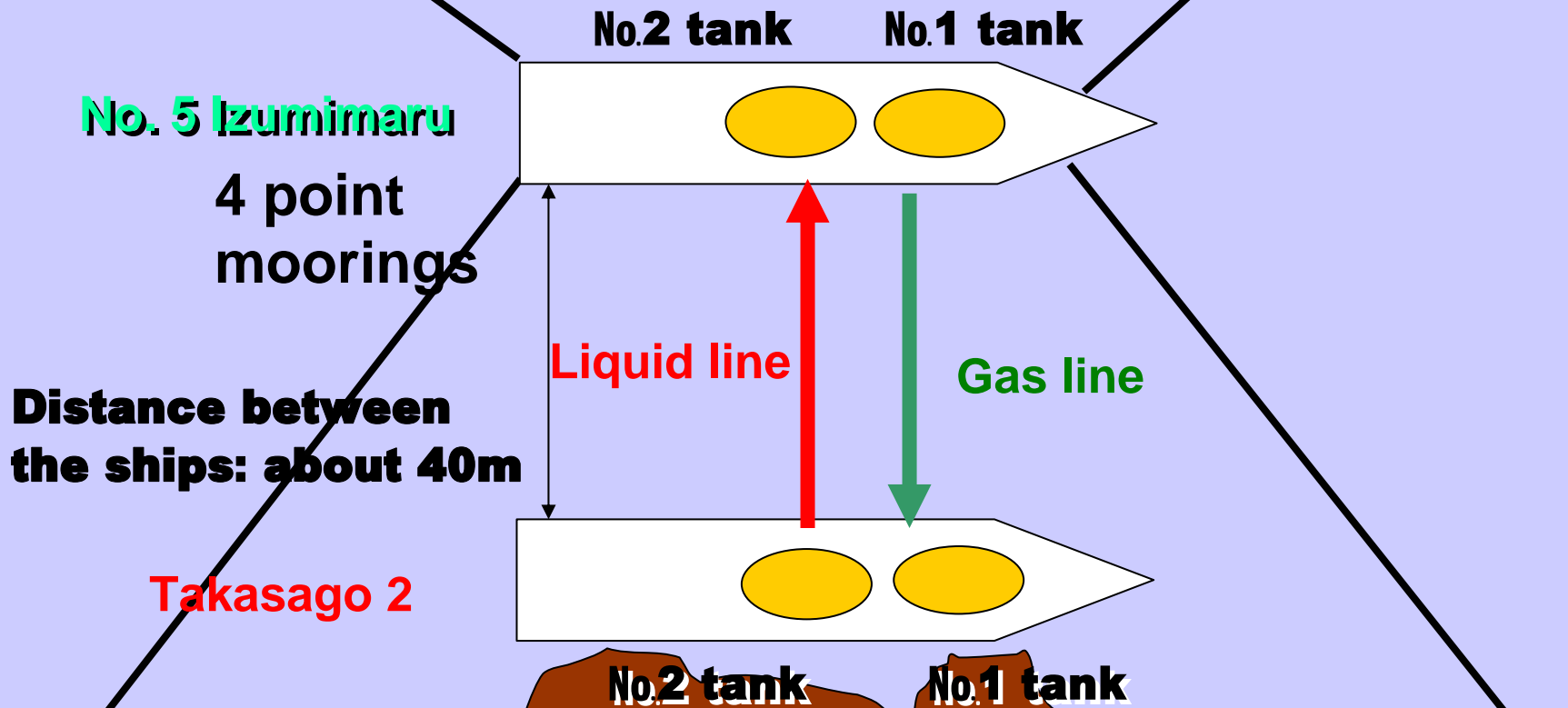
# LPG Lighterage Technique 1



# LPG Lighterage Technique 2

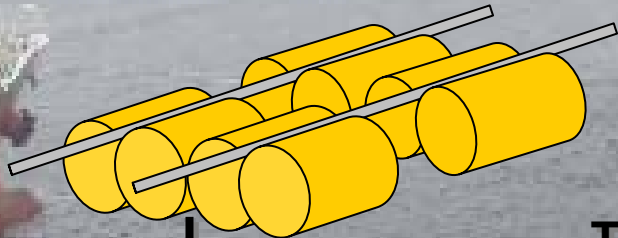
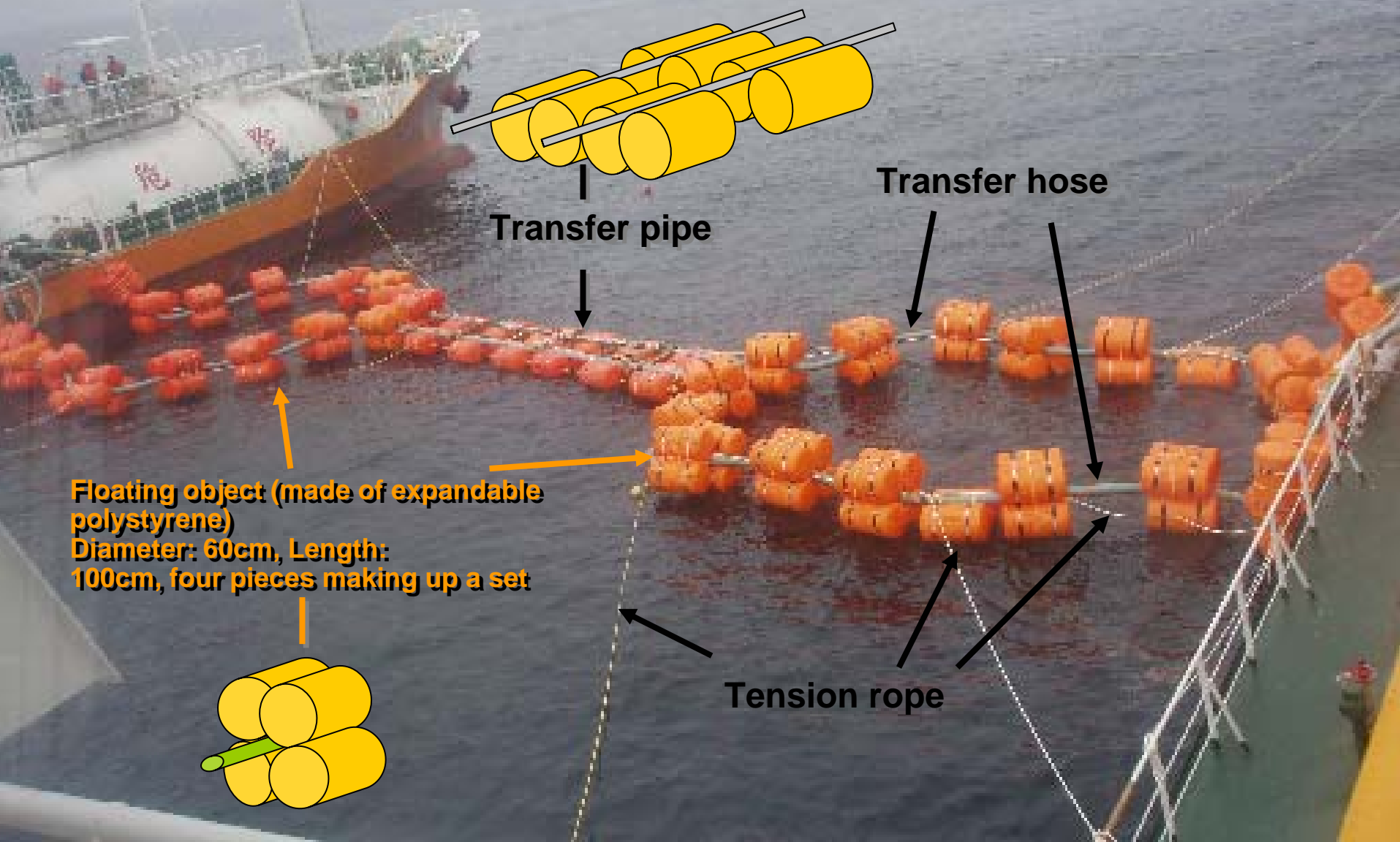


# LPG Lighterage Technique 3



- Resistible to stormy weather to some degree;
- Difficult to fit and recover transfer hoses.

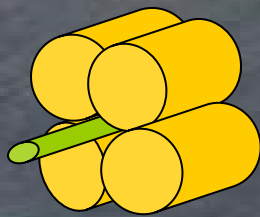
# Conditions of Lighterage Operations



Transfer pipe

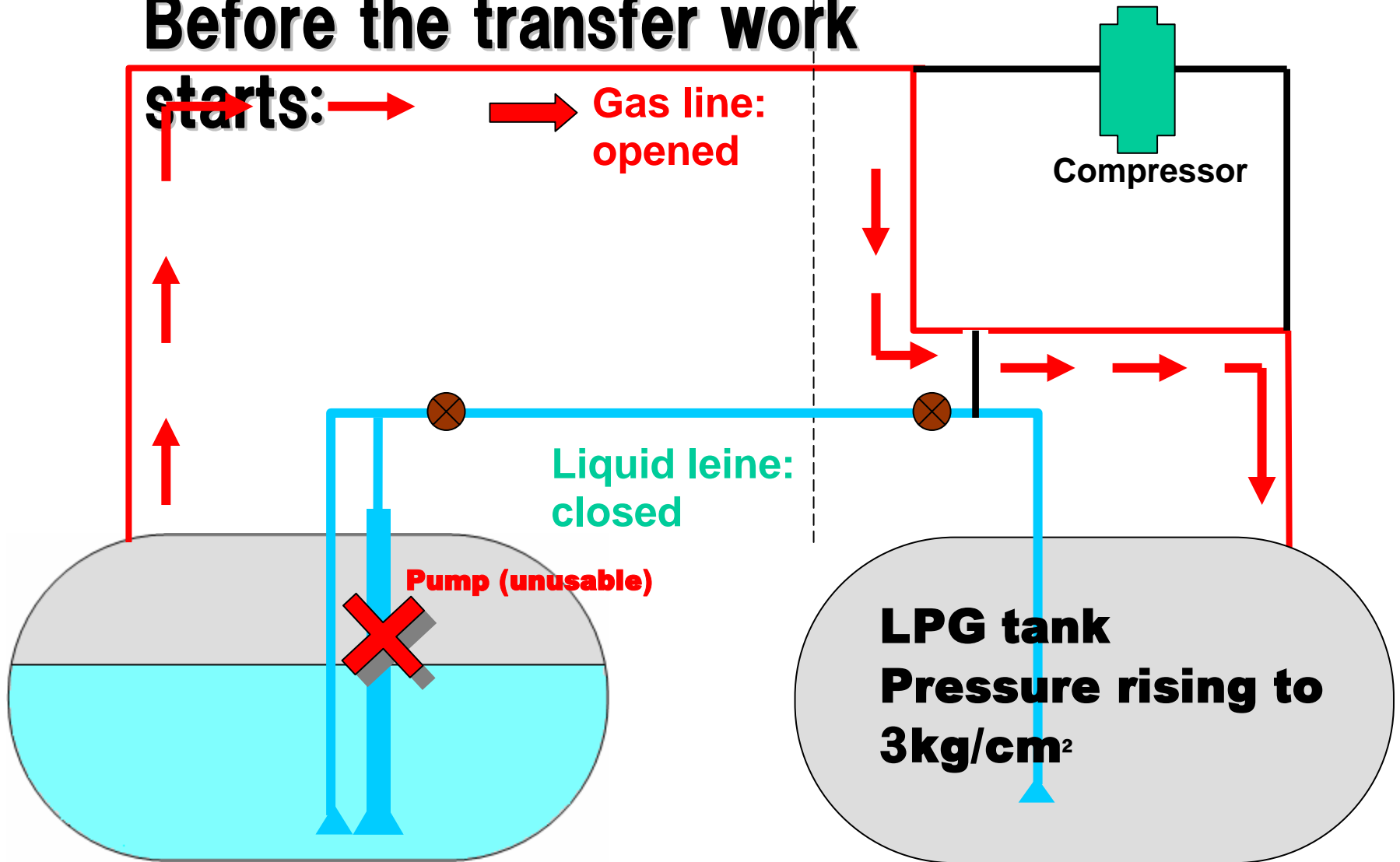
Transfer hose

Floating object (made of expandable polystyrene)  
Diameter: 60cm, Length: 100cm, four pieces making up a set



Tension rope

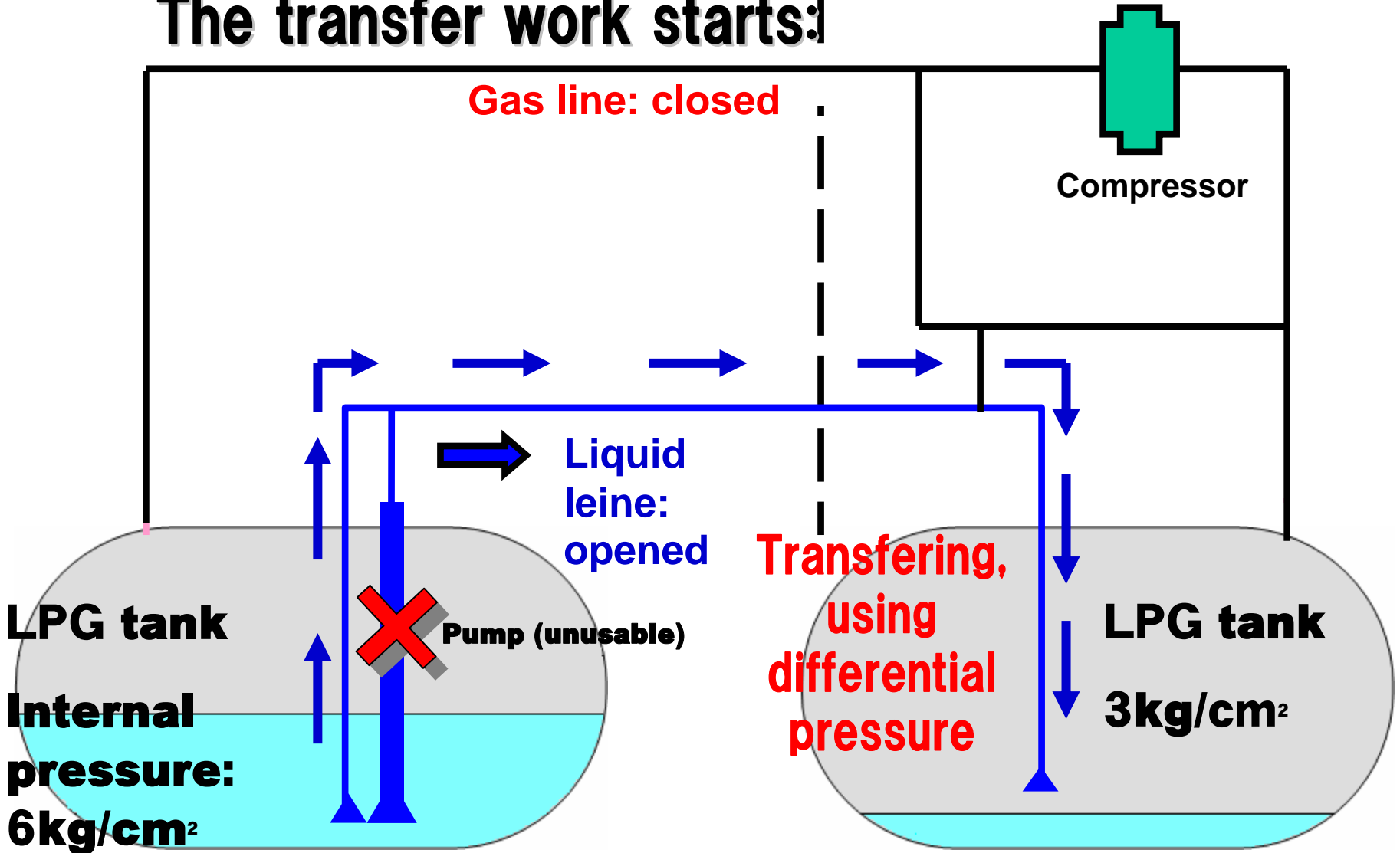
# Before the transfer work starts:



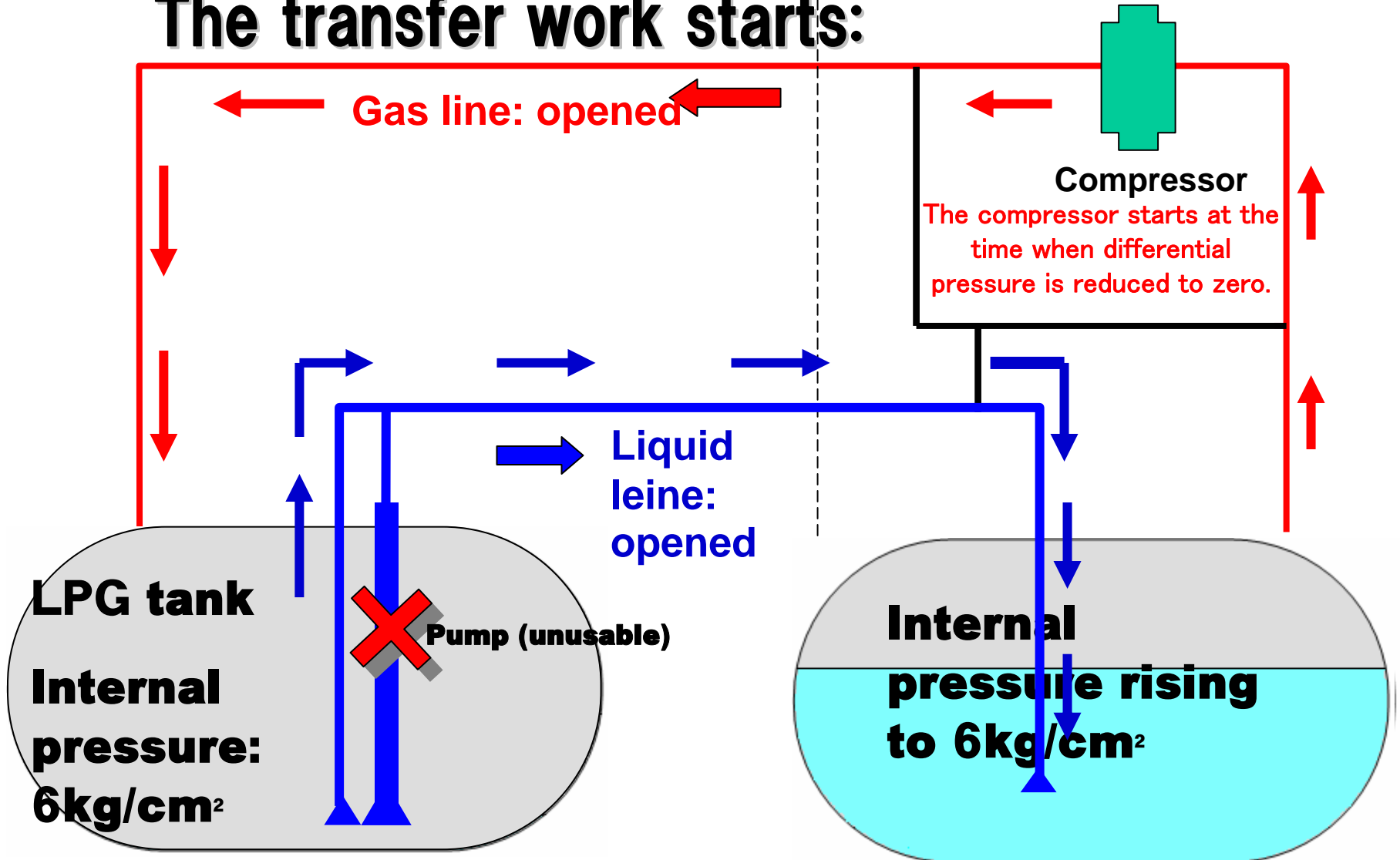
The Takasago 2

The No. 5 Izumimaru

# The transfer work starts:



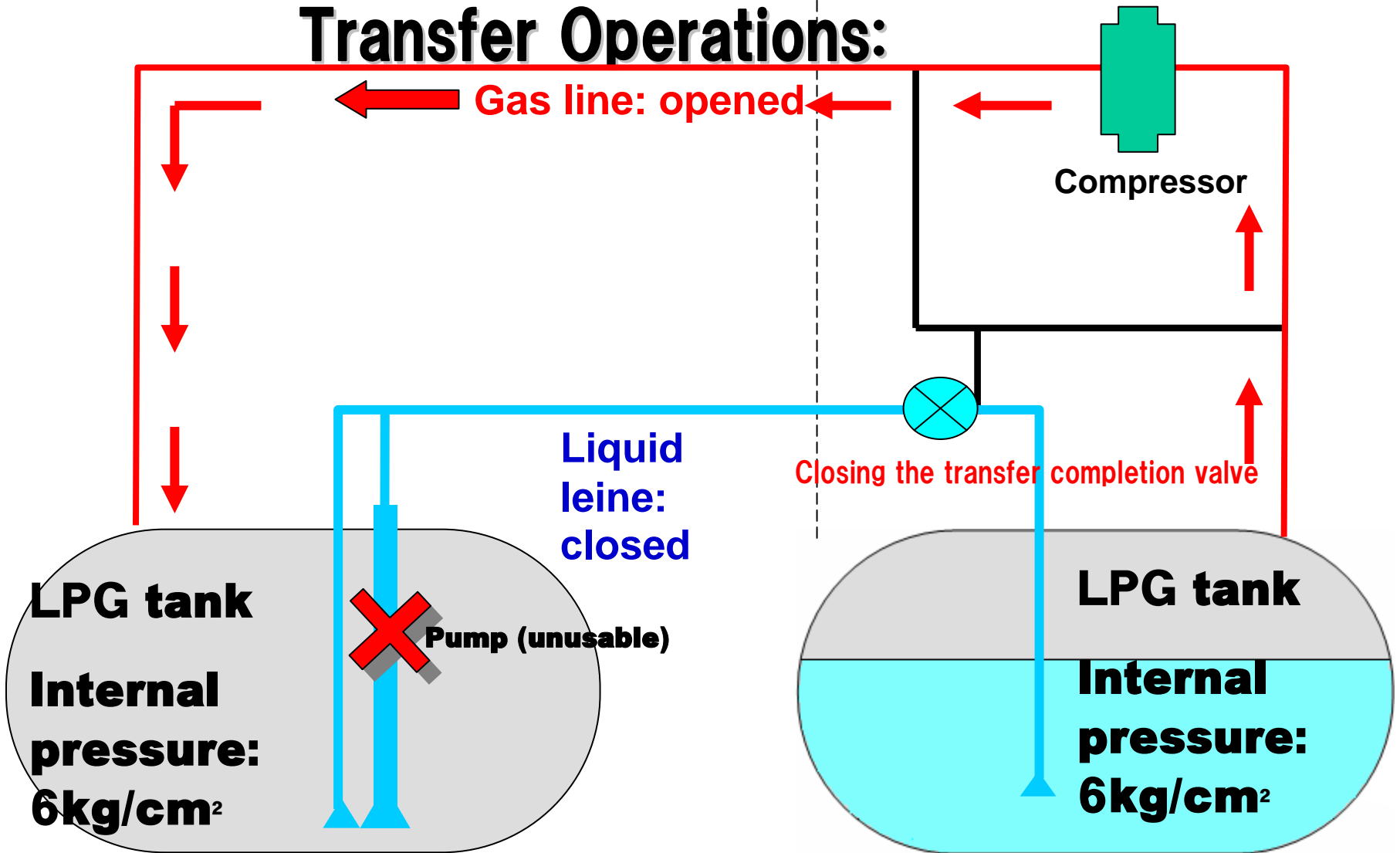
# The transfer work starts:



The Takasago 2

The No. 5 Izumimaru

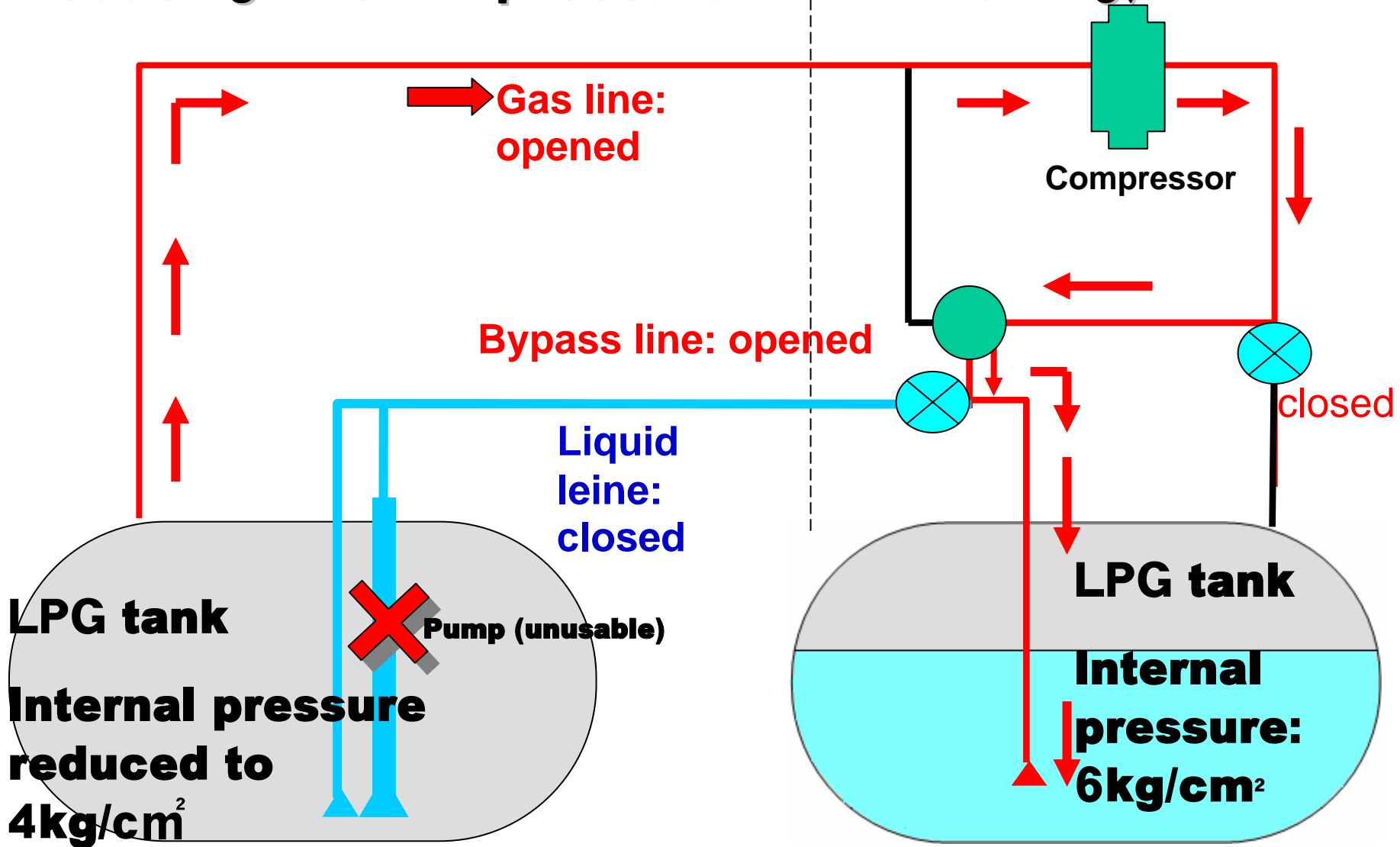
# Completion of Liquid Transfer Operations:



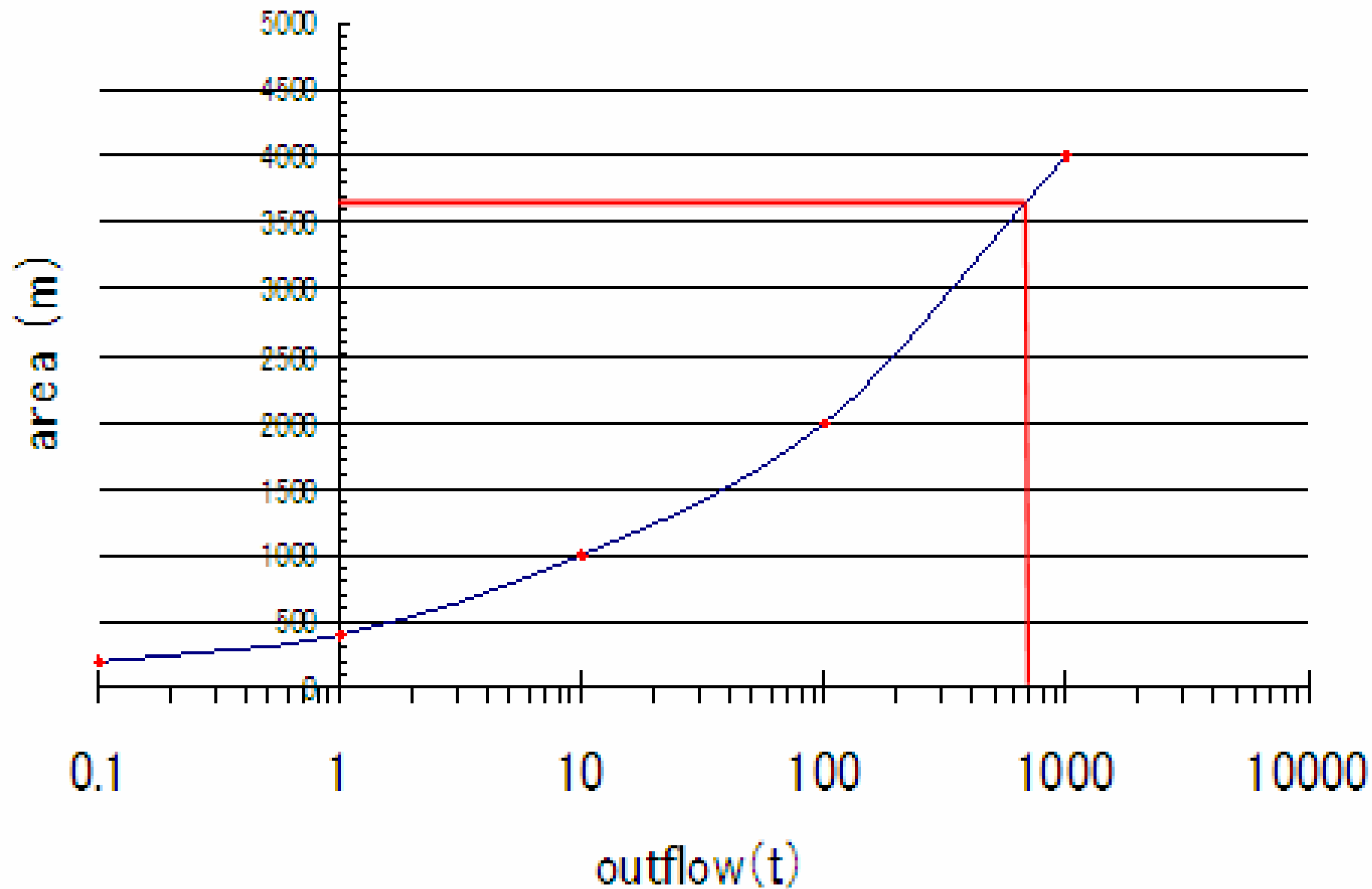
The Takasago 2

The No. 5 Izumimaru

# Reducing internal pressure from 6 to 4 kg/cm<sup>2</sup>



# LPG : Health Risk , Fire / Explosion Risk



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# END

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