

LPG TRANSPORTATION VIA WATERWAYS



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LPG AND CNG TRANSPORTATION VIA WATERWAYS

Design Project -I
Samudra Shipyard (P) Ltd.

Submitted by -
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Acknowledgement

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I specially thank Mr. Unni Mohan for his inputs and feedback on the project.

Rajkumar kewat

Date - 5th July 2016

Declaration

I declare that this written report represents my own idea in my own word, and where others, ideas or words have been included, I have mentioned the original source. I also declare that I have adhered to all principles of academic honesty and integrity and have not falsified, misinterpreted or fabricated and idea, data, facts or source in my submission. I understood that any violation of the above will be cause for disciplinary action by the institute and can also penal action from the source from which proper permission has not been taken, or improperly cited.

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Date 5th July 2016

Signature

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Samudra Shipyard (P) Ltd.

Samudra Shipyard (P) Ltd. is a Manufacturer and Supplier of all types of Watercrafts including House Boats, Speed Boats, Water Scooters, Paddle Boats, Canoes etc.

For the first time in India, fibre glass house boats are being introduced by Samudra Shipyard , India's No 1 fibre glass boat builders. Having been into boat building for more than 3 decades.



B  the art & science of
TBUILDING

Backwaters experience



Public transport commute between close islands

We started our journey with boat rides to understand the waterways transportation. Public transport boats travelled between small distance, there are some long distance boats also like Alappuzha to kollam eight hours journey of 85 kilometer. We travelled in different kind of boats from public transport to private leisure boat. Each boat has their feeling of ride and a different raveling experience.



"Shikara" leisure boat from small group of people



Double deck boat for alappuzha to kollam



A hop-on-hop-off boat service has been introduced in the Kochi-Muziris tourism circuit of Kerala. This boat gives a tour to muziris port, Paliyam Nalukettu Museum, Sahodaran Ayyappan Museum and much more heritage places in Kochi. Whereas the Kopra valam is Family leisure tour boat. We experience the ride of a canoe also, which is really a fun to experience the water from very close.



Introduction to Industry



Different type of Fibre reinforced Plastic for use at different location according to the strength required. Process of making FRP panels where the employee applying resin first on the table surface, which provides the finish surface to the panel and above that they add other fibre glass material. For more strength extra layers can be added.



Applying resin on the surface



Adding layer of fibre glass

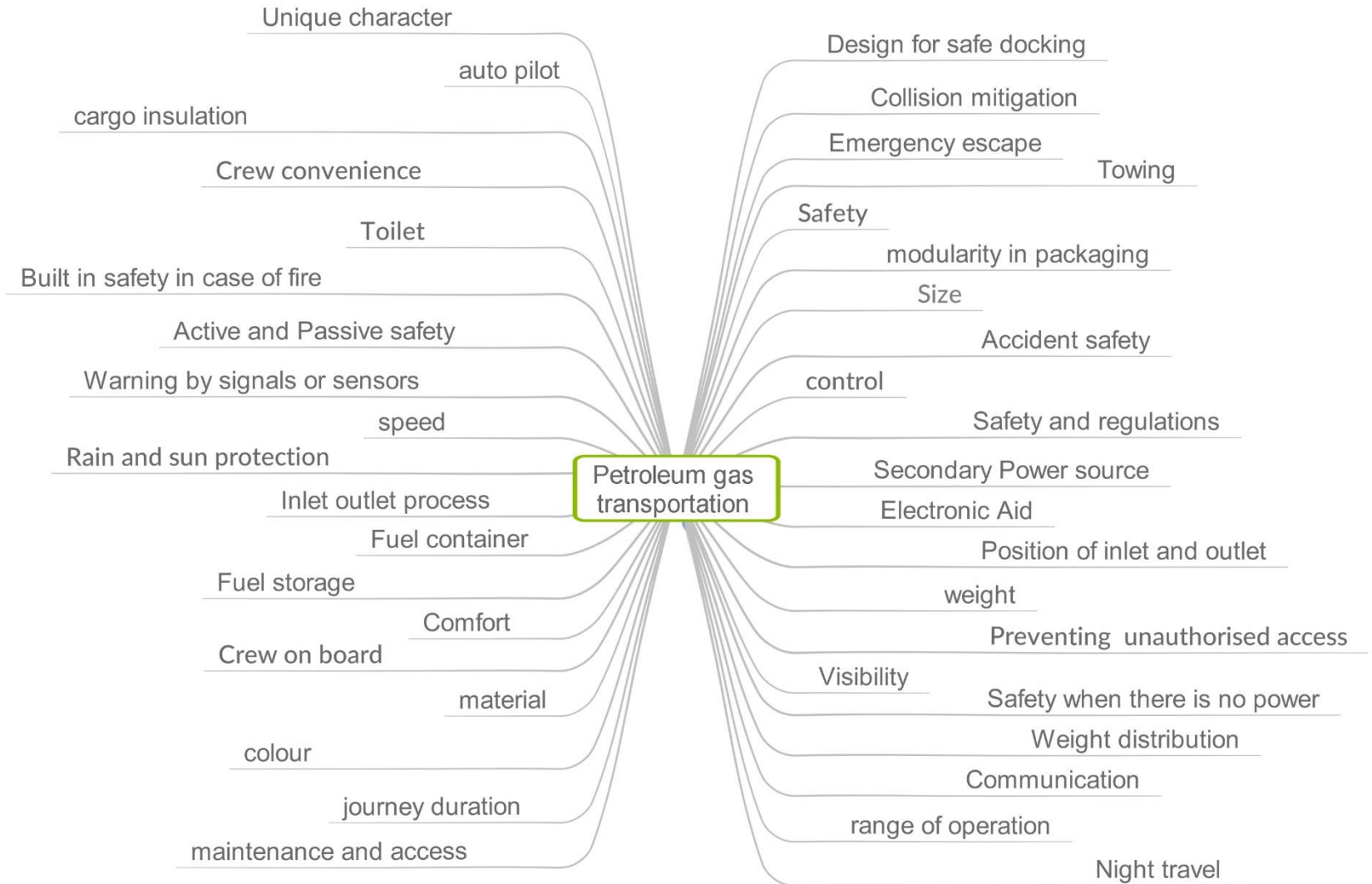
DESIGN BRIEF

Design a cargo boat to transport LPG or CNG for distribution in Kerala through national waterways

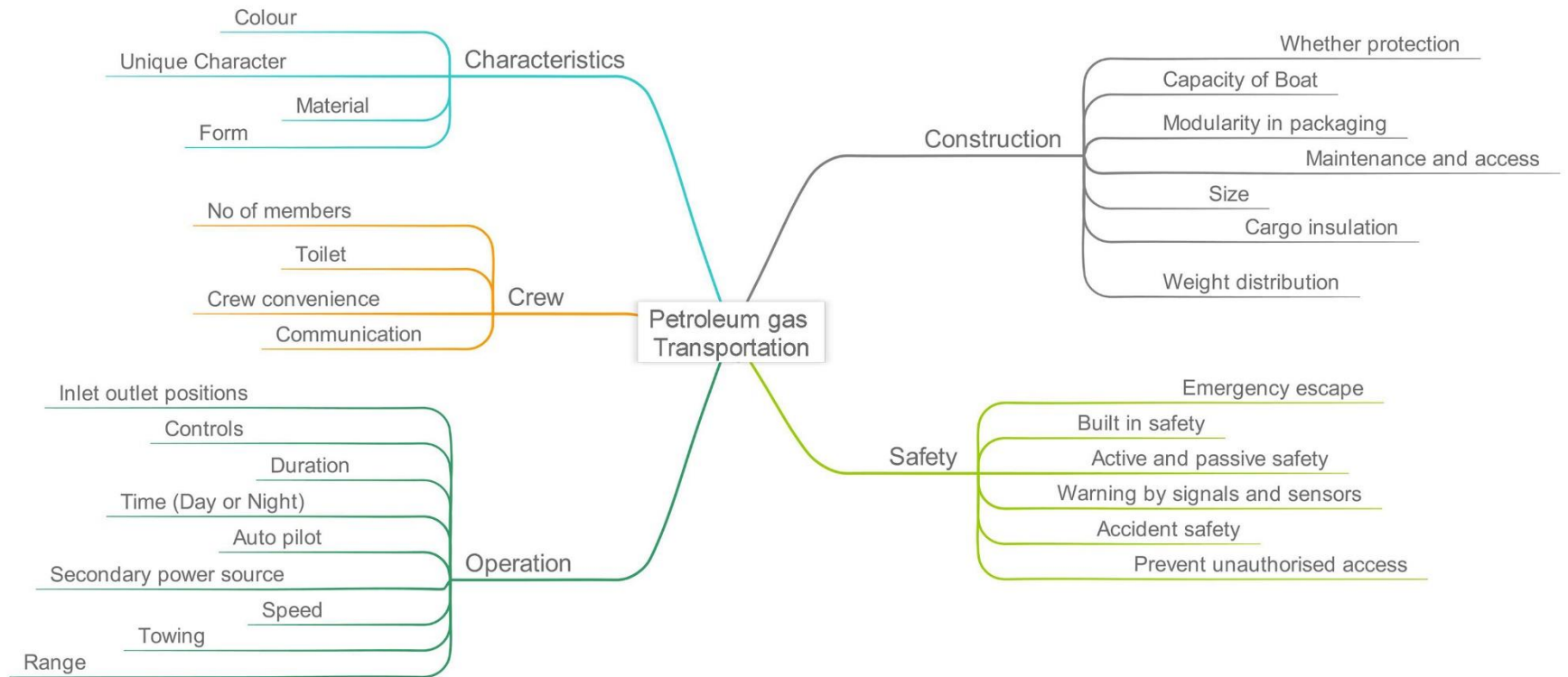
A man is seated at a desk, playing a veena. He is wearing a dark blue shirt and glasses. In front of him, several students are seated, watching him play. The room has blue walls and a window in the background. A water bottle is on the desk.



Keyword from Brain storming



Keyword grouping



Need of project

Increased number of accidents of LPG, CNG, Hazardous chemical carrying truck.

Failure of the LNG Kochi terminal.

Focus of the government to enhance the Inland water transport through national waterways

Problems

NATIONAL » KERALA

KANNUR, September 2, 2012

Updated: September 2, 2012 20:04 IST

Chala gas tanker toll rises to 19

A CORRESPONDENT

COMMENT · PRINT · T T

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K.P.C.C. President Ramesh Chennithala and Minister of State for Power K.C. Venugopal during a visit to the houses of victims of Tanker explosion at Chala in Kannur district on Sunday. Photo: S. K. Mohan. The Hindu

TOPICS

government
safety of citizens

politics

regulatory policy and
organisation

Death toll of the Chala LPG tanker tragedy rose to 19 with three more people succumbing to injuries at various hospitals on Sunday.

Minister of State for Power K.C. Venugopal, Kerala Pradesh Congress Committee president Ramesh Chennithala and Director General of Police K.S. Balasubramanyam visited the spot and the houses of accident victims on Sunday.

August 30. Rejina's father-in-law, mother-in-law, brother-in-law and two other relatives had died earlier. Rizwan and Rejina died at Pariyaram Medical College while Pushpalatha passed away from a private hospital in Mangalore. The condition of Pushpalatha's husband Kunhikrishnan, their son Vineth and Rejina's brother-in-law Prasad is said to be critical. Induklia, wife of sub-inspector Rajan who died on September 1 is also battling for life at Mangalore. Their daughter Niha Raj had died on August 30.

Speaking to reporters, Mr. Chennithala said that the all proper steps should be taken by the government to avert such mishaps in the future.

The victims should be sufficiently compensated by providing government employment to their family members, he said.

Mr. Balasubramanyam after visiting the accident site said that the probe which was in the right direction would bring under its purview the Indian Oil Corporation to establish the real cause of the tragedy.

He had earlier paid homage to Rajan, the sub inspector of coastal police station at Azhikkal who had died of burns on September 1, when the body was kept at the Police Club here.

Keywords: Kerala, Chala, Tanker explosion, Special cabinet session

Article 1 - <http://www.thehindu.com/news/national/kerala/chala-gas-tanker-toll-rises-to-19/article3850944.ece>

Narrow national highways in Kerala are open invitation for accidents. Whenever an accident happens of a petroleum tanker or PLG tanker it creates panic in people nearby it. Lots of people lose their lives and lots of people get affected by such accidents. Road accident in Kochi and Kannur highway are very frequent and enormous.

NATIONAL » KERALA

KANNUR, January 14, 2014

Updated: January 14, 2014 11:02 IST

LPG tanker topples, catches fire near Kannur

SPECIAL CORRESPONDENT

COMMENT · PRINT · T T

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TOPICS
Kerala
Kannur

disaster and
accident
accident (general)
disaster management
fire

A bullet tanker carrying liquid petroleum gas (LPG) from Mangalore caught fire after it overturned on the National Highway at Kallyasseri in Kannur in the early hours of Tuesday.

The incident occurred at around 4 a.m. when the tanker on its way to Kozhikode overturned after hitting a vehicle coming from the opposite side. The tanker, carrying 18 tonnes of LPG belonging to the Indian Oil Corporation, lost control after it was hit by the vehicle. On seeing the leakage of gas from the tanker the driver and the cleaner immediately fled from the cabin and informed nearby residents to leave in view of the possibility of an explosion.

Around 20 Fire tenders from Kannur and nearby areas reached the spot to extinguish fire. District Collector M.G. Rajamanickam and Superintendent of

Police A. Srinivas reached the spot and ordered the evacuation of the residents living in the vicinity, as the fire was still billowing from the tanker. The authorities said that IOC experts from Mangalore and Kozhikode were on their way to Kallyassery. The fire units are not able to go near the tanker as the gas continued to leak from the tanker.

As the LPG tanker tragedy at Chala in Kannur on August 27, 2012, which claimed the lives of 20 people, was fresh in memory, the authorities and the residents were taking extra precaution to avert similar situation. The fire tenders, which reached the spot around 7 a.m. started spraying water on the tanker from a safe distance.

The road traffic on the National Highway was diverted following the incident.

Keywords: LPG tanker fire, gas leakage, LPG tanker accidents, State Disaster Management Authority

Article 2 - <http://www.thehindu.com/news/national/kerala/lpg-tanker-topples-catches-fire-near-kannur/article5576498.ece>

Home » News » One killed, 34 injured as LPG tank...

Tuesday, 28 August 2012 17:09

One killed, 34 injured as LPG tanker explodes in Kannur

CD Network, Photos by Rajesh Kumar



Kasargod, August 28: A woman was killed when an LPG tanker lorry burst into flames after an accident and set her house nearby on fire near the Chala temple, six km from Kannur, police said on Tuesday. Thirty-four people were injured in the accident.

The incident occurred when the lorry carrying liquefied petroleum gas (LPG) overturned after hitting a divider around 11.30 pm on Monday.

While the driver and a helper ran for safety, the vehicle caught fire and the flames engulfed five houses and some shops nearby.

A 50-year-old woman, Sreelatha, died in the fire. She was sleeping, when her house, 200 metres from the accident site, caught fire. She succumbed to her injuries on Tuesday.

The condition of seven of those injured is stated to be serious, said doctors. Twenty-seven more people suffered from burn injuries and are being treated in Kannur and Kozhikode hospitals.

"We were around five km from the accident spot and heard a huge explosion and bright lights," said a witness. "Had there been no heavy rain at that time, the disaster would have been greater."

After the accident, Kerala Chief Minister OommenChandy rushed to Kannur on Tuesday and met district authorities.

Article 3 - <http://coastaldigest.com/index.php/news/44254-one-killed-34-injured-as-lpg-tanker-explodes-in-kannur>

Lessons Not Learnt from Chala Tanker Tragedy

By K R Ranjith - KANNUR | Published: 15th January 2014 09:12 AM | Last Updated: 15th January 2014 09:12 AM



The gas tanker which overturned and caught fire at Kallasseril in Kannur on Tuesday | A Sanesh

It took more than 12 hours for the people of the district to heave a sigh of relief. As the fire fighters and the police continued efforts to contain the fire from the gas tanker that overturned at Kallasseril even after the lapse of 12 hours into the mishap, everyone waited with bated breath as the dreadful memories of the Chala tragedy in August 2012 came haunting.

Even though a major tragedy was fortunately averted, it was a grim reminder that another mishap may occur anytime, thanks to the sorry state of our roads and the callousness of the public sector oil companies. It also laid bare the lack of equipment and facilities to quickly contain gas leak from tankers in case of an accident. As the safety valve on the rear side of the gas tanker was emitting fire, the local people were also spitting fire against the Indian Oil Corporation for the lack of proper safety measures. Minister K P Mohanan said that the 20 safety directions given to oil companies when transporting gas was apparently not adhered to in this instance. An expert study and proper corrective measures should be undertaken on the National Highway in the area to avert accidents in the future, he added. The oil companies had been directed to implement 20 safety measures as per the Investigation report on the Chala tragedy in which 20 people were charred to death.

Meanwhile, in a self-revealing instance, the emergency response vehicle of the public limited oil company HPCL reached Kallasseril seven hours after the accident. HPCL security officer Tarun, who visited the spot, did not respond to questions of reporters.

Minor but scary gas tanker mishaps had occurred in the state even after Chala. In a recent incident, gas leaked from a tanker at Karivellur, near here, on September 29. But the driver of the tanker risked his life and stopped the leak with bare hands. He kept his fingers pressed into the pressure valve for more than an hour to save an entire locality!

K V Rajendran, a social worker, said that accidents were regular in the area from Mangad to Keechery due to unscientific road alignment and dangerous curves. "I have been hearing for more than 28 years that accident-prone sharp curves and slopes on the NH would be straightened, but nothing was done on the ground."

"The government should order a thorough scientific investigation to find out why major accidents like these recur on the roads in the state, and remedial measures should be taken," said CPM leader Kodiyeri Balakrishnan.

He also blamed the oil companies for not taking safety directions seriously. "The government too is not keen to press the companies to strictly adhere to the safety regulations. In the wake of frequent tragedies and accidents in the district, an office of the Disaster Management Authority should be opened in Kannur," he demanded.

Article 4 - <http://www.newindianexpress.com/states/kerala/Lessons-Not-Learnt-from-Chala-Tanker-Tragedy/2014/01/15/article2000544.ece>

Fire disaster following LPG tanker explosion at Chala in Kannur (Kerala, India): August 27, 2012.

Abstract

A fire disaster following LPG tanker explosion occurred at Chala bypass, Kannur, Kerala, India on August 27, 2012. The three chambered tanker with total 16tonnes (162.57 quintal) LPG collided with a road divider and exploded thrice. A total of 41 people became victims during first blast; out of which 20 died in various hospitals. Five people remained inside the house after first blast and escaped unhurt from the zone of accident before second blast. All the victims were transferred to various hospitals; of these, six were transferred to the burns unit of the Kasturba Hospital, Manipal (320km from Chala). Five (5/6) were transferred within 1-5 days at our burns unit suffered 31-72% total body surface area (TBSA) burn, none had external injuries. One (1/6) was transferred on 20th day as a follow up case of 15% TBSA burn with 4% residual raw area and diabetes mellitus. Except one, all were managed conservatively using Limited access dressings (LAD; Negative Pressure Wound Therapy). One of the patient wound bed prepared under LAD and on 41 post burn day underwent split skin grafting under LAD. Out of the six patients admitted at the burns unit, two (2/6) admitted patients expired (one due to inhalation injury and another due to sepsis with multiple organ failure). One survivor (1/4) developed sepsis related liver dysfunction with hepatomegaly but recovered well. The total hospital stay of survivors at the burns unit varied from 8 to 60 days (mean hospital stay 36.5 days). All the victims who developed psychological symptoms were treated by psychiatrists and counselled before discharge. Three of survivors developed psychological symptoms. Two of them (2/3) developed mixed anxiety-depression disorder (ICD 10 code F41.8) and one of these two showed grief reaction too (ICD 10 code F43.23). One victim (1/3) developed non-organic insomnia (ICD 10 code F51.0) and responded to counselling. The article describes the incident, mechanism of the incident, injuries sustained, author, explanations on pattern of burn and suggestions in relation to future safety measures.

Copyright © 2013. Published by Elsevier Ltd.

KEYWORDS: Clinical forensic; Disaster; LPG; LPG tanker burst; Limited access dressing; Mass burn casualty

Article 5 - <http://www.newindianexpress.com/states/kerala/Lessons-Not-Learnt-from-Chala-Tanker-Tragedy/2014/01/15/article2000544.ece>



Photograph 1 - <http://coastaldigest.com/index.php/news/44254-one-killed-34-injured-as-lpg-tanker-explodes-in-kannur>

Failure of Kochi LNG Terminal

LNG terminal is delayed more than 2 years and still there is no sign of progress. LNG terminal initially is considered as the benchmark in the development, its considered as a key to reduce the gas tanker accidents on national highways.

NATIONAL » KERALA

Updated: September 16, 2015 05:46 IST

KANNUR, September 16, 2015

Protest delays GAIL pipeline project

SPECIAL CORRESPONDENT

COMMENT · PRINT · T T

The opposition of land owners to the proposed gas pipeline by the Gas Authority of India Ltd. (GAIL) remains a sticking point in the efforts of the district administration to accelerate procedures for making land available in the district for the pipeline project.

The meeting held by District Collector P. Bala Kiran on September 14, to discuss measures to expedite action for getting consent of land owners for laying the pipeline underground was inconclusive. It ended in commotion with the land owners staging a walkout in protest saying that they would not allow the pipeline laying under their plots as they did not want to live in constant fear of disaster for the rest of their lives.

As the efforts of the district administration to speed up the land availability for the natural gas pipeline reached a deadlock following dissent from the residents, Mr. Kiran said that the issue would be discussed at the meeting of District Collectors scheduled on September 17 and 18. The meeting saw political leaders expressing the view that GAIL authorities should ensure safety of the project and market rate for the land identified for laying the pipeline. A good compensation package matching the one announced for the Kannur airport and an initiative to make the people aware of the pros and cons of the project were stressed at the meeting.

The efforts of GAIL Chief Manager Tony Mathew to explain the importance of the gas pipeline to be linked as part of the national network were eclipsed in protest. He said that public safety would be ensured.

CITIES - KOCHI

Updated: April 9, 2016 07:13 IST

ALAPPUZHA, April 9, 2016

Delay in LNG pipeline laying to be poll issue in Alappuzha

R. RAMABHADHRAN PILLAI

COMMENT · PRINT · T T

LDF has held discussion with commerce, industry leaders

The Left Democratic Front (LDF) is likely to take up issues pertaining to the inordinate delay in the completion of the LNG pipeline project during campaigning in the district.

The LDF leadership has held parleys with commerce and industry leaders who have underlined the need to complete the project. Communist Party of India (Marxist) (CPI(M)) leaders have already gone on record that the project will receive due attention if the LDF assumes power.

Lack of connectivity

The commissioning of the LNG terminal in Kochi two years ago was considered a milestone in the history of development projects in the State.

But it could not make the desired impact in the industrial scene due to the inability of the authorities to ensure pipeline connectivity to the intended areas.

The pipeline project, envisaged for completion along with the commissioning of the terminal, got delayed mainly due to protests from landowners, backed by political parties, in the districts in north Kerala.

Laying of the pipelines, under the Petroleum & Minerals Pipelines (acquisition of right of user in land) Act, 1962, meant that the ownership of land would rest with the title holders who could take up cultivation, subject to conditions.

While the pipelines could be laid in Ernakulam without much trouble, the work was halted in several other districts.

Political forces

Industry sources said certain political forces were working behind the scenes.

The United Democratic Front (UDF) government, which failed to expedite the project, at a later stage authorised Collectors to take action to ensure completion of the project. The project is in progress, but no date has been set for completion yet.

It is against this background that the LDF is coming forward with a promise to complete the project which is expected to take gas to Kanjirode and from there to Mangaluru and Bengaluru through separate pipelines.

The original plan to lay an undersea pipeline to Kayamkulam from the LNG terminal at Puthuvype in Kochi has also been neglected.

The government failed to chalk out a strategy to take the fishermen into confidence after the latter opposed the project.

Nor was there any move to lay an alternative pipeline along the Kochi-Alappuzha land route.

Work delayed due to landowners' protests

Plan for undersea pipeline did not materialise

LArticle 4- <http://www.thehindu.com/news/cities/Kochi/delay-in-lng-pipeline-laying-to-be-poll-issue-in-alappuzha/article8453957.ece>

Home » Cities » Kochi

LNG Kochi Terminal Not of Any Benefit to Kerala

By Express News Service | Published: 30th January 2016 05:27 AM Last Updated: 30th January 2016 05:27 AM

Email 0



KOCHI: In January 2014, then Prime Minister Manmohan Singh dedicated the Rs 4,500 crore LNG Terminal at Puthuvype in Kochi to the nation. Even after two years the terminal is not of any benefit to the nation or the state.

The Petronet LNG Terminal project became 'idle' because of the non-laying of the pipeline by Gas Authority of India Ltd (GAIL).

Petronet LNG Ltd incurs a loss of roughly Rs 400 crore in its Kochi operations every fiscal. The primary reason for it being nearly static gas offtake from the terminal, with little progress on the supply pipeline. The LNG Terminal in Puthuvype was commissioned in August 2013, and was officially dedicated to the nation in January 2014.

The latest twist in the tale is that the state government accuses GAIL of going slow on the project as they have not awarded the contract to carry out the project till date. Kerala government officials said GAIL had earlier agreed to award the work contract by the beginning of January 2016.

GAIL officials said the work of the LNG pipeline project in five districts except Kozhikode and Malappuram would start in February.

"The pending pipeline work in Ernakulam, Thrissur, Palakkad and Kasargod districts will resume soon. The survey in Kannur district is yet to be completed and the government has to take a decision on the land price there. The issues in Malappuram and Kozhikode districts are yet to be resolved. Going forward the monsoon will be a challenge before the implementation of the project. We are hopeful to complete the pipeline laying by the end of financial year 2016-17," said a GAIL official.

The Petroleum and Natural Gas Regulatory Board (PNGRB) held an open house discussion for finalisation of natural gas pipeline tariff of Kochi-Koottanad-Bangalore-Mangalore pipeline recently. Another joint open house on the tariff will be held on February 16 in New Delhi.

There are allegations from many quarters about the 'slow progress' of the pipeline work saying that GAIL wanted to cover up the low revenue from the Dabhol-Bangalore pipeline. If the Kochi-Bangalore pipeline becomes a reality, the significance of the former pipeline will be lost and the revenue from it will fall significantly.

"It seems GAIL is deliberately slowing the Kochi-Mangalore-Bangalore pipeline project. The survey for the Koottanad-Bangalore pipeline has been completed. But the company is not awarding the contract citing that 100 per cent survey is not completed. No where in the country did they wait for the survey to be fully completed for a project. When the survey for 30 per cent is completed the work contract is normally given," said a state government official.

White elephant

- Petronet LNG Ltd incurs a loss of roughly Rs 400 crore in its Kochi operations every fiscal.
- The LNG Terminal in Puthuvype was commissioned in August 2013, and was officially dedicated to the nation in January 2014.
- the state government accuses GAIL of going slow on the project as they have not awarded the contract to carry out the project till date
- GAIL officials said the work of the LNG pipeline project in five districts except Kozhikode and Malappuram would start in February
- The Petronet LNG Terminal project became 'idle' because of the non-laying of the pipeline by Gas Authority of India Ltd (GAIL).
- Gas offtake from the terminal is nearly static

Opportunity

Government expecting Rs 25 lakh crore investment for infra development: Nitin Gadkari

PTI | Apr 30, 2016, 02:17AM IST

Tags: shipping infrastructure | roads | Nitin gadkari | Infrastructure | Indo-American Chamber of Commerce

NEW DELHI: The government is expecting investments worth Rs 25 lakh crore over the next 3 years in the roads, railway and shipping infrastructure that includes setting up of 27 industrial clusters at ports at around Rs 8 lakh crore, Union Minister Nitin Gadkari said today.

"We are committed to overhaul country's infrastructure and gradually working towards achieving this. We plan to spend Rs 25 lakh crore in our highways and shipping sector which includes setting up of 27 industrial clusters near ports at an estimated cost of Rs 8 lakh crore," Gadkari said.



Apart from Rs 8 lakh crore on developing 27 industrial clusters, another about Rs 5 lakh crore would be spent on road, railway and ports connectivity projects, the Minister said on the sidelines of an event by Indo-American Chamber of Commerce.

Besides, smart cities will be built at ports which will entail a huge investment, he said.

Earlier addressing the Chamber event, Gadkari said, "By May this year, awards in highways projects will swell to Rs 2 lakh crore from Rs 1.6 lakh crore now and by May 2017 it will be another 5 lakh crore."

He said concerted efforts by his Ministry to expedite road projects has started bearing fruits and the road building pace, which was barely 2 km a day when the Narendra Modi government took over, has reached 20 km a day and will touch 25 km a day next month.

He added that at the time of taking charge of the Ministry, 403 projects worth Rs 3.35 lakh crore were stuck; but most of the issues have been addressed and barring 31 projects worth about Rs 30,000 crore all are being executed, he said.

He further said that out of the six planned ports in the country, three alone at Tamil Nadu, West Bengal and Maharashtra would entail an investment of Rs 60,000 crore.

Massive work is also being done on waterways front and detailed project reports are being worked out for converting 111 rivers into waterways.

Work on the stretch between Pala in Haryana and Vizirabad will be initiated in three months' time, he added.

"I dream of making waterways in India, at a level that the National Highways have been made. Till date, the waterways have never been given importance, But, these waterways will lead the nation to progress," said by Nitin Gadkari.

Article 4 - http://articles.economictimes.indiatimes.com/2016-04-30/news/72726800_1_lakh-crore-highways-projects-union-minister-nitin-gadkari

Our Ministry will contribute 2-3% to GDP growth: Nitin Gadkari

By Premia Katyar, ET Bureau | 22 May, 2016, 04:31AM IST

[Post a Comment](#)

On low share (6%) of waterways in transport compared to China (47%)

I agree that the share of waterways is minuscule in our country, it is 6% now and has risen 2.5% in the last two years. The Congress government never looked to increase the share of coastal traffic and waterways. I have started work on five such projects and DPR (detailed project report) of 18 is ready. Work on the stretch between Pala (in Haryana) and Wazirabad (in Delhi) will be started in three months. Having said that I know that it a difficult task, it is a new subject but I am trying my best. We can't be sure but we will try to shift 15% of road transport of **BSE -0.56 %** fertilizer, cement etc to waterways in five years. I believe it will be done.

Article 5 -

<http://economictimes.indiatimes.com/opinion/interviews/our-ministry-will-contribute-2-3-to-gdp-growth-nitin-gadkari/articleshow/52377776.cms>

Work on Rs 4,200 crore Jal Marg Vikas project takes off

By PTI | 2 Jun, 2015, 06:01PM IST

[Post a Comment](#)

READ MORE ON » World Bank | Jal Marg Vikas | IWA | Inland Waterways Authority of India

NEW DELHI: The 'Jal Marg Vikas' (National Waterway-1) project, which envisages developing a fairway between 1,620 km Allahabad and Haldia stretch, has taken off with a \$3.5 million funding from the World Bank.

"The Jal Marg Vikas Project on River Ganga has now taken off with the World Bank extending a project preparation fund (PPF) of \$3.5 million ... as advance, which is part of its financial assistance for the project," Inland Waterways Authority of India (IWA) has said.



The central government has designated the IWA as the implementing agency, with a Project Management Unit (PMU), for the Jal Marg Vikas Project, an IWA spokesperson said.

Article 6 - <http://economictimes.indiatimes.com/news/economy/infrastructure/work-on-rs-4200-crore-jal-marg-vikas-project-takes-off/articleshow/47515752.cms>

Inland Waterways has become one of the key leaders in economic development: Reports

05 May, 2016

India's economic growth is directly proportional to its logistics sector and now inland waterways where the government has also given the green signal. Many major cities are inseparably linked to the rivers and situated on their banks.

Article 7 - <http://www.merinews.com/article/inland-waterways-has-become-one-of-the-key-leaders-in-economic-development-reports/15915942.shtml>

We will try to shift **15% of road transport** of fertilizer, cement etc. to waterways in five years.

The **development of NW-1** would result in a viable supplementary mode of transport and huge quantities of bulk cargo can be transported thereby helping in economic development of this region, the spokesperson added.

Inland water transport (IWT) also has **tremendous potential for cargo movement and tourism**. The excellent environment credentials, the high safety standards for shipments and the large carrying capacity of the vessels are just some of the outstanding features of this long standing mode of transport.

Key points

- National waterways Bill (2015) aims at declaring **106 additional inland waterways** as NW in addition to the five existing national waterways.
- Gov. is developing National Waterway-1 (NW-1) under the **Jal Marg Vikas Project**, with assistance from the World Bank, About NW-1: 1620 km Haldia - Allahabad stretch of River Ganga
- Development of multi-modal terminals, strengthening of open river navigation technique, modern **River Information System (RIS)**, **Digital Global Positioning System (DGPS)** etc.
- River Information System(RIS) launched to facilitate safe, accurate navigation

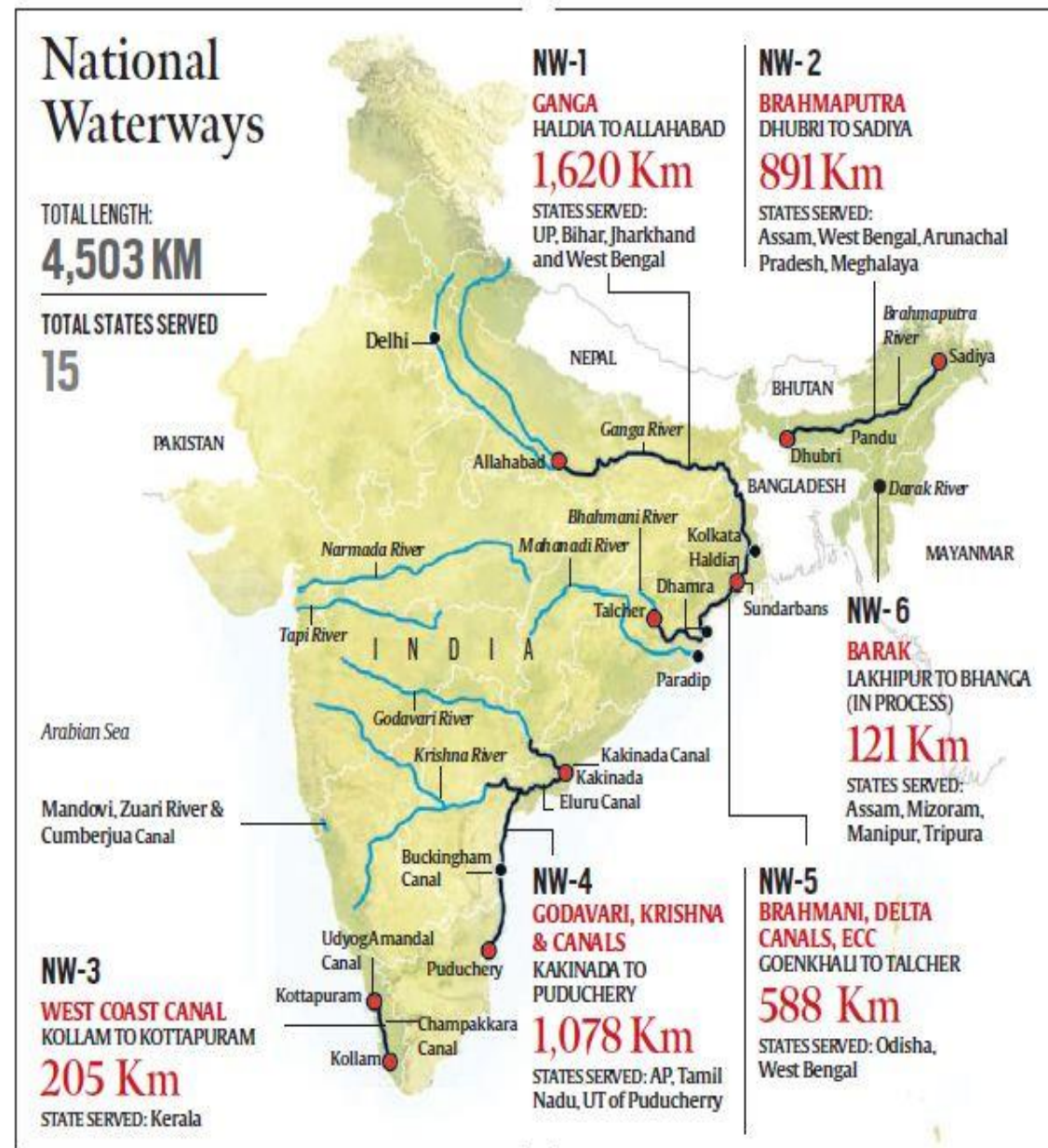





Fig 1 - <http://www.civildaily.com/story/inland-waterways-converting-rivers-to-national-waterways/#post-6080>

Benefits of Inland waterways

Recognized as **fuel efficient, cost effective and environment friendly** mode of transport, especially for bulk goods, hazardous goods and over dimensional cargos

			
One horsepower can carry	4000 kg	500 kg	150 kg
One liter fuel can move	105 ton-km	85 ton-km	24 ton-km
Cost per kilometer	25-30 paisa	1 rupee	1.5 rupee

Cost of developing waterways much lower than rail on road.

Immense potential for domestic cargo transportation as well as for cruise, tourism and passenger traffic.

Systematic development will open up progressive economic and transport opportunities in the country

Reduces congestion and accidents on highways

Open up considerable investment and business opportunities in the areas like water-based tourism, construction and operation of terminals, creation of storage accommodation, and provision of other facilities required for smooth water-based navigation and Help to generate **millions of new jobs**

limitations/ problems to implement this national waterway project

India's water channels will need to have adequate width, depth and air clearance. Many **rivers are seasonal**, with water flows declining sharply after the monsoon

Navigating such rivers in the lean season may, therefore, require **regular and extensive dredging and desilting**.

Higher water salinity, especially in the coastal regions and estuaries, and constant inflow of silt in the rivers can also be problematic

Water highways will require **more river ports** with their **support infrastructure** – road and rail connections, warehouses and other services

Heavy investment will be needed also to procure equipment, including dredgers, shipping vessels and barges of different sizes



Fig 2(Desilting Process)- <http://budcline.aminus3.com/image/2012-03-12.html>



Fig 3 (Dredging) - <https://sandrp.wordpress.com/2014/11/25/lessons-from-farakka-as-we-plan-more-barrages-on-ganga/>

Study of cargo distribution by road transportation



Factory



Capacity – 25-20 ton



Capacity 15 ton



Capacity 10 ton



Capacity 1 ton



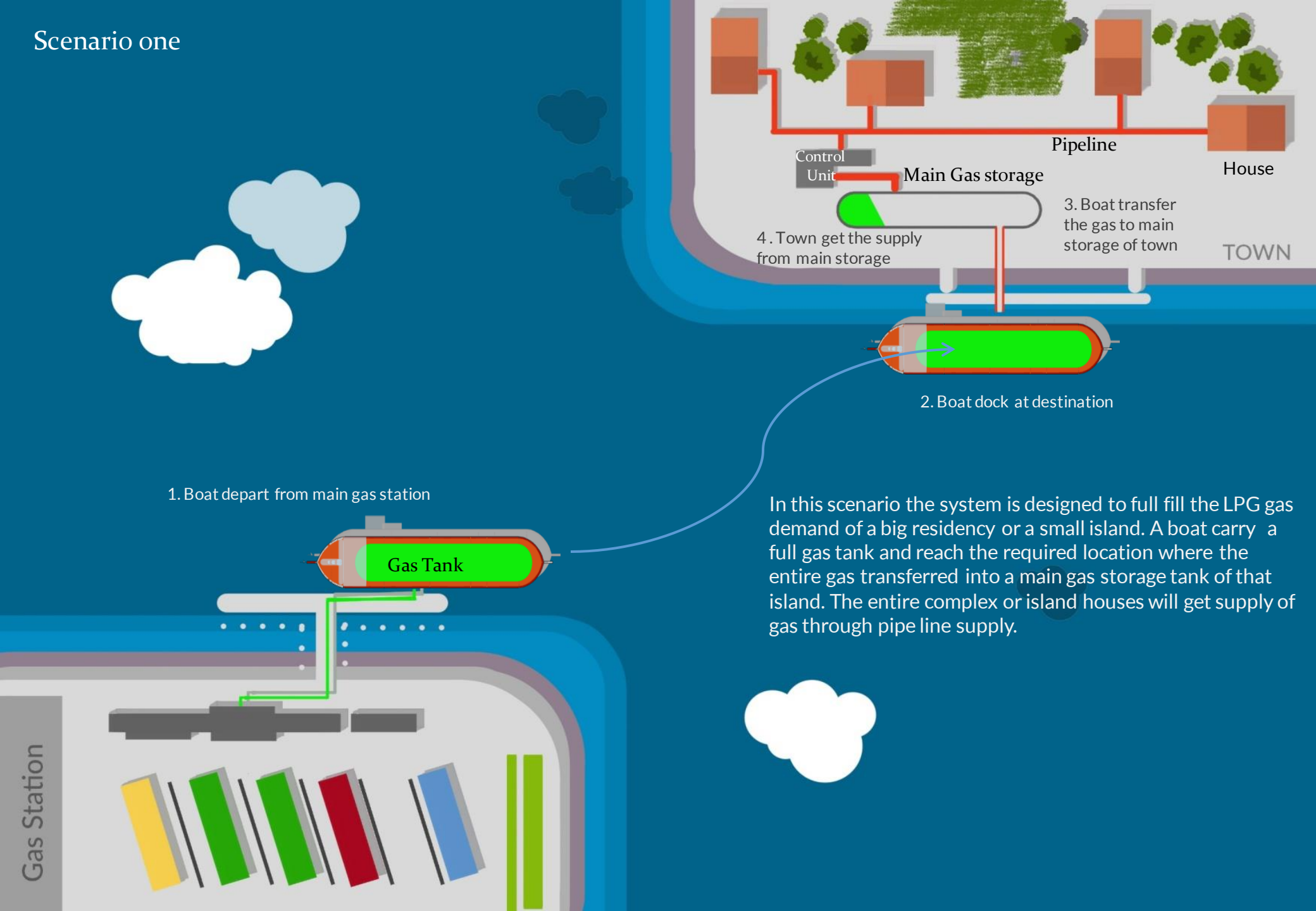
Capacity 4 ton



Capacity 7 ton

Scenarios for distribution of LPG in Kochi through waterways

Scenario one

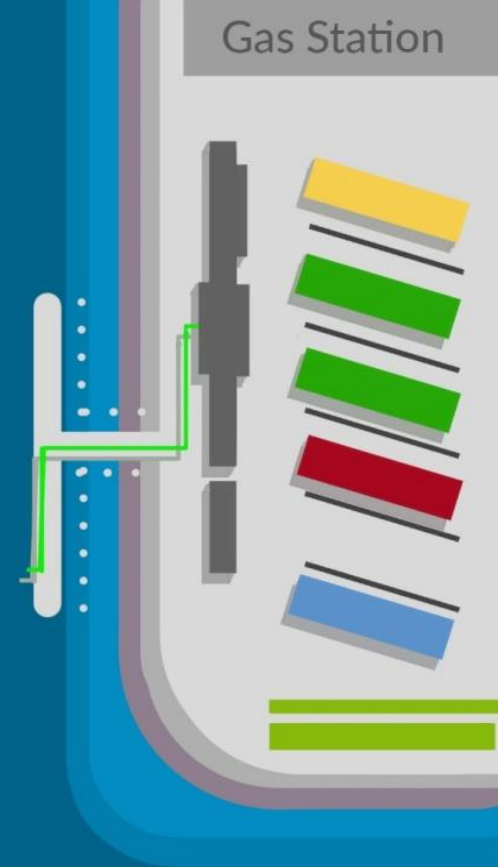
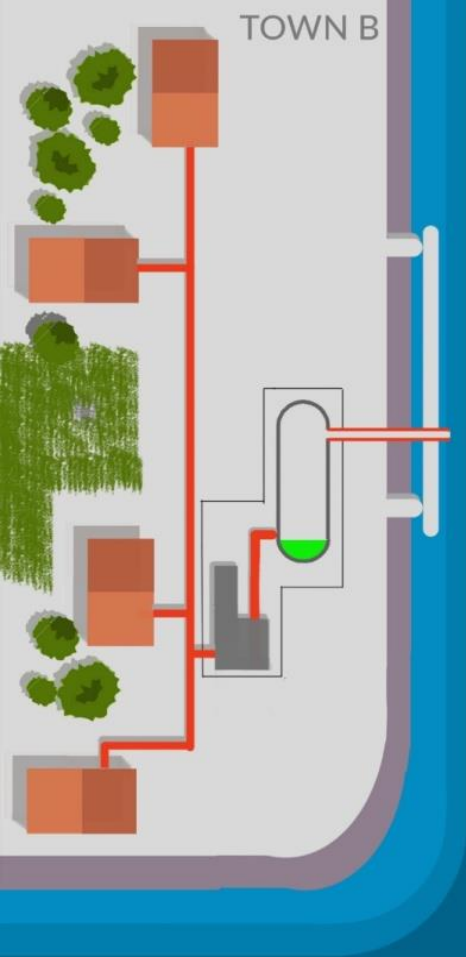


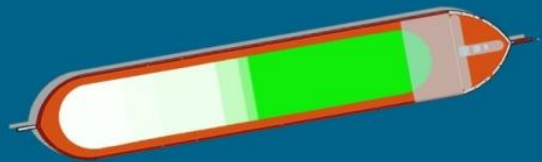
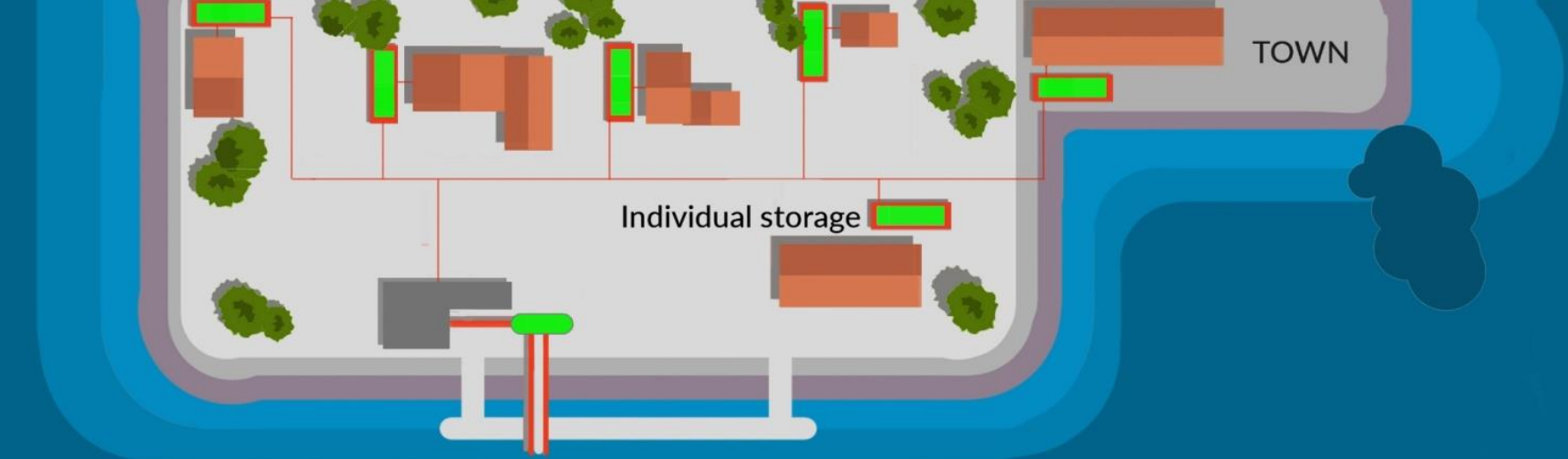
Possible locations for scenario



Scenario Two

This scenario is same as scenario one in terms of operation.
Instead of supplying gas to one location here the boat capacity
Is much bigger so that it can supply more than one location in one go.

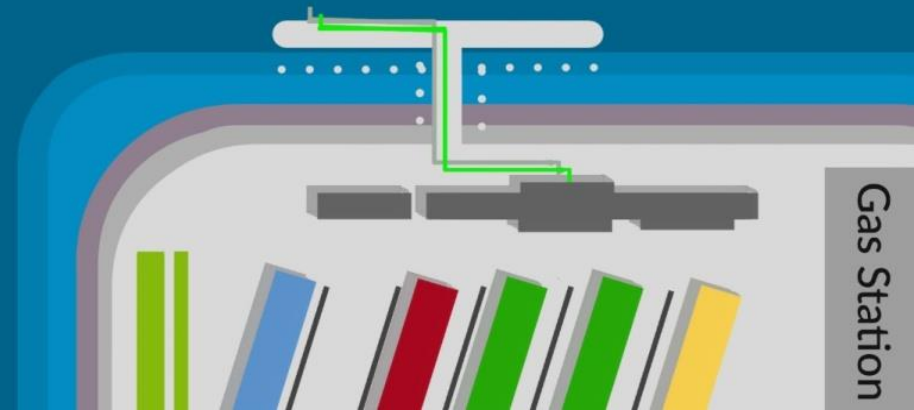


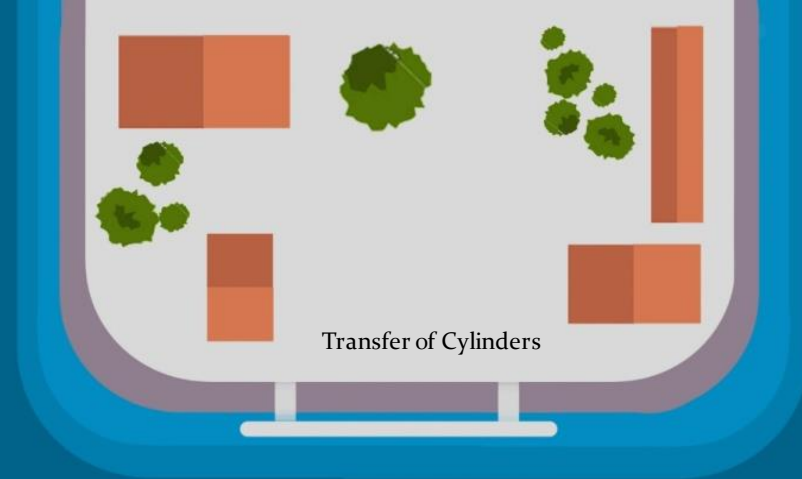


For next Town

In this scenario houses have the same gas pipe line supply but instead of having main town gas storage tank they have Their own individual gas storage. Just like water supply and rest of the process of distribution of gas is same as scenario two

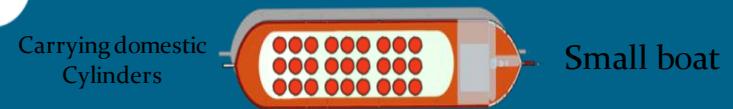
Scenario Three





For next Town

This scenario show that domestic gas cylinders also can be delivered through boats with proper safety.

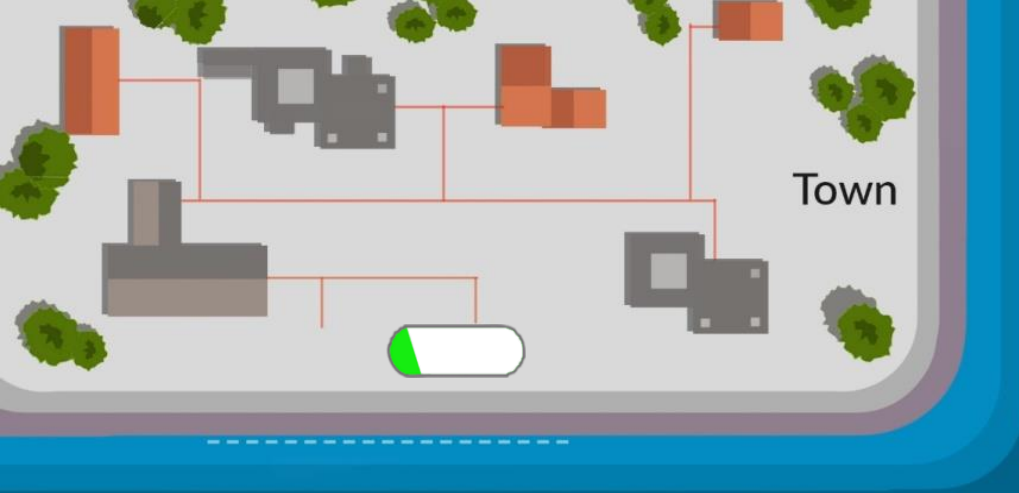


Scenario Four



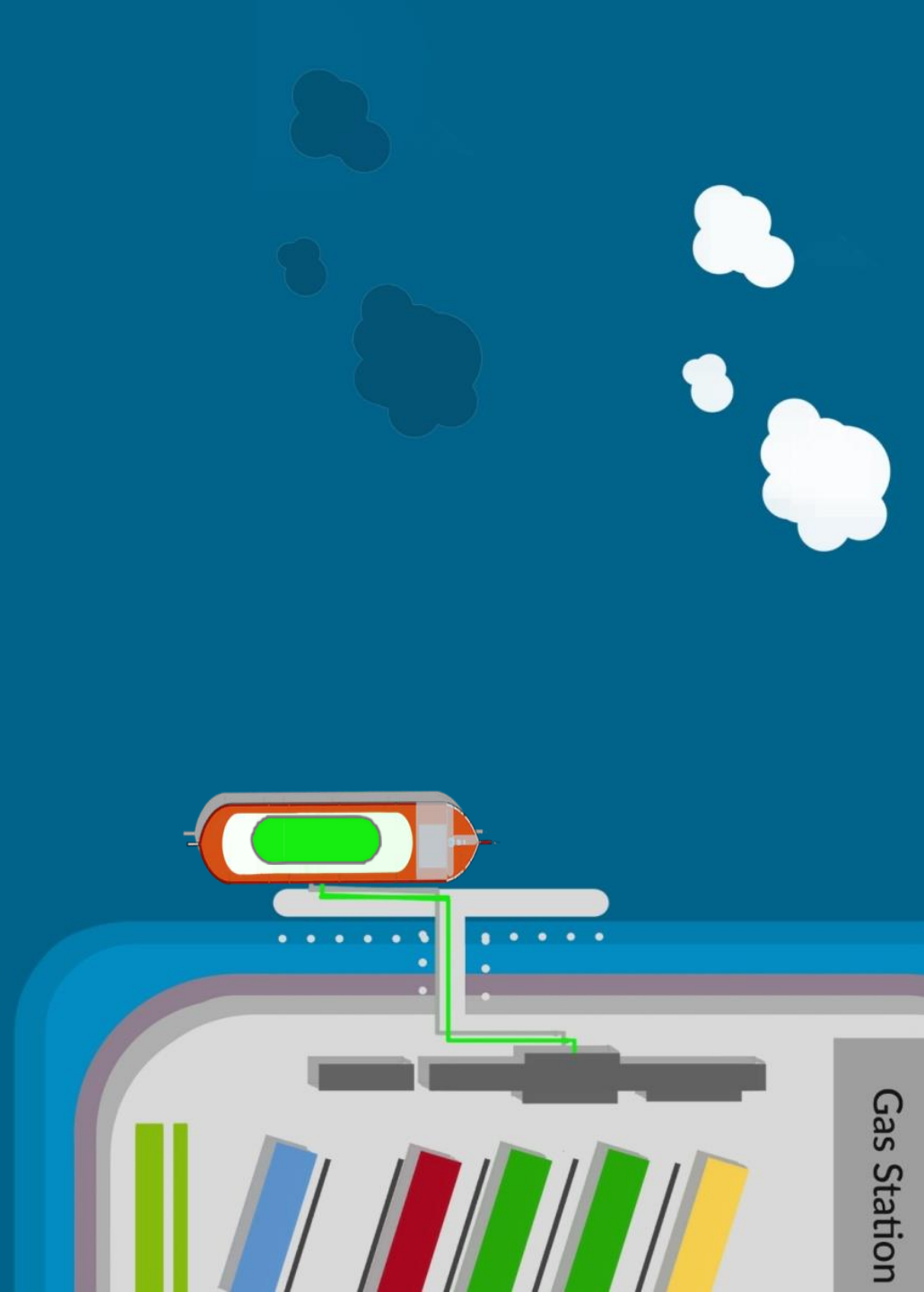


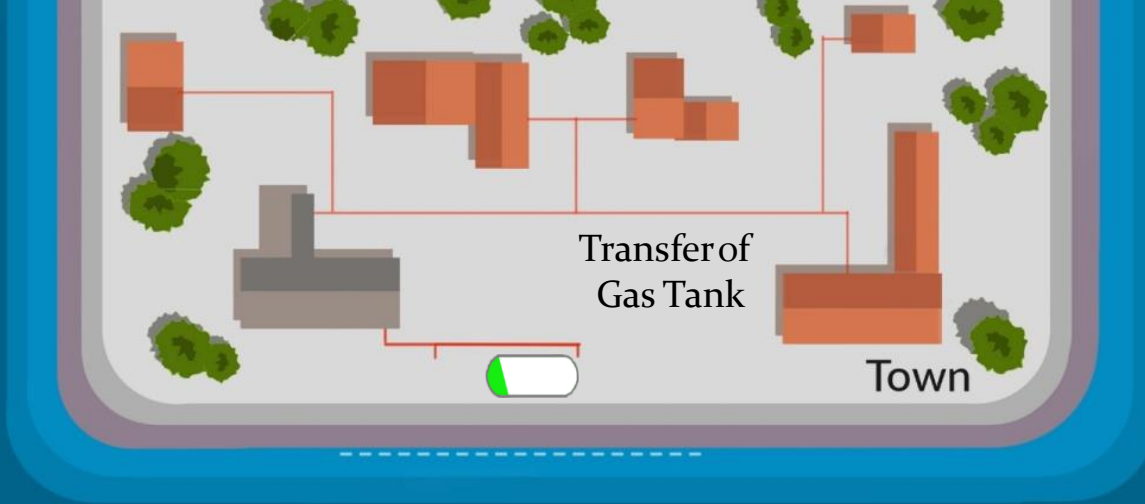
Possible locations for scenario



In this scenario instead of transferring the gas from boat gas tank to main storage of gas tank in town, the entire gas tank will get interchanged which will require less time then the process of transferring gas.

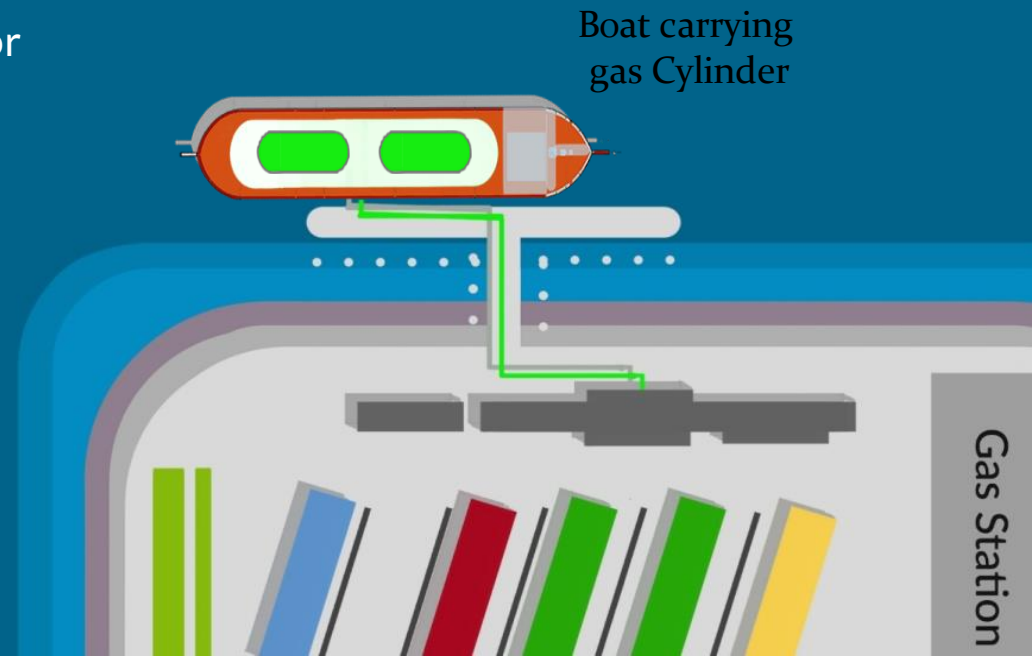
Scenario Five





To next Island

This scenario is like a sub part of previous scenario where number of gas tank can be carried by boat for delivering at different locations.



Scenario Six

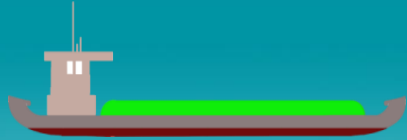
Possible locations for Scenario



Mechanisms for gas tank transfer



Transferring of tank through a crane on island



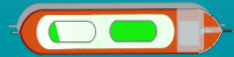
Mechanism second

For small capacity cylinders tanks



Mechanism Third

For very small gas containers



Transferring of tank through a crane on boat itself



Supply for
Small town
Or
Big Hotel

Mechanism Four

Small cylindrical containers



Things to consider

Hull dimensions – (28m * 4.87m * 1.4 m , 12m * 2.5m * .85m).

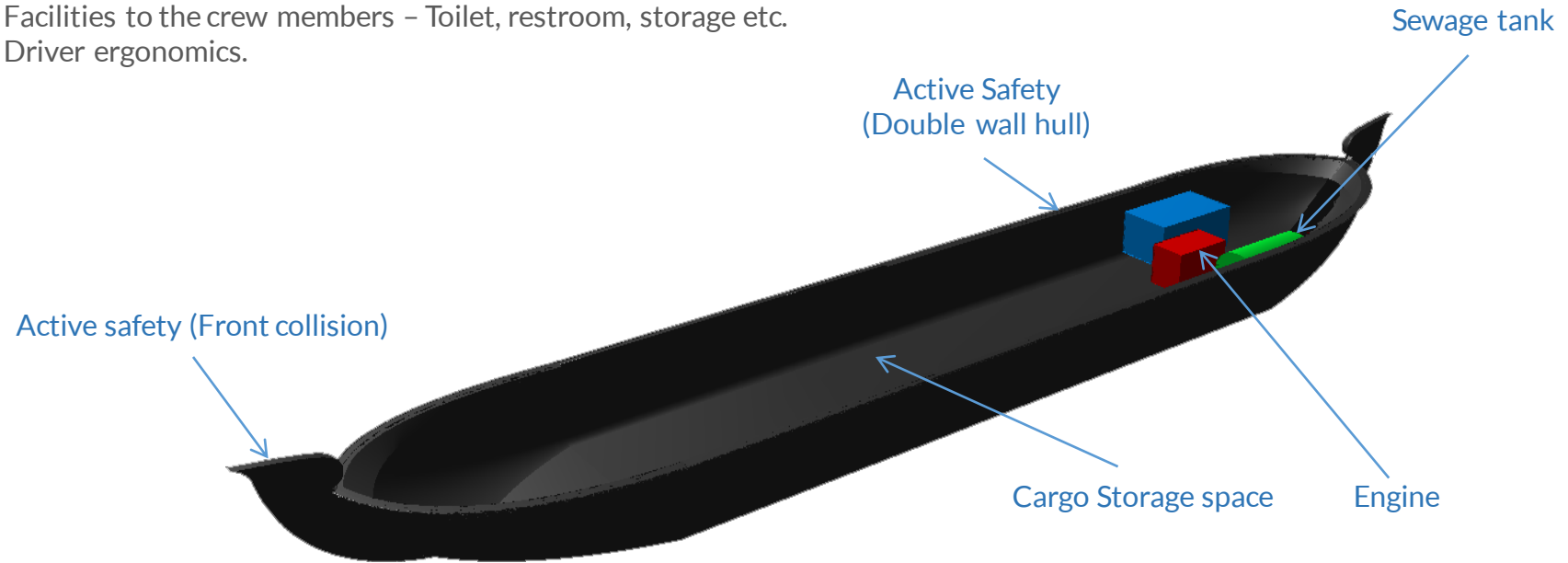
Capacity – 48 ton and 8 ton.

Number of crew members – 2 to 3.

Driver position.

Facilities to the crew members – Toilet, restroom, storage etc.

Driver ergonomics.



Safety -

Active safety – Double wall hull design for reduce hull failure in crash.

- Gas leak sensors

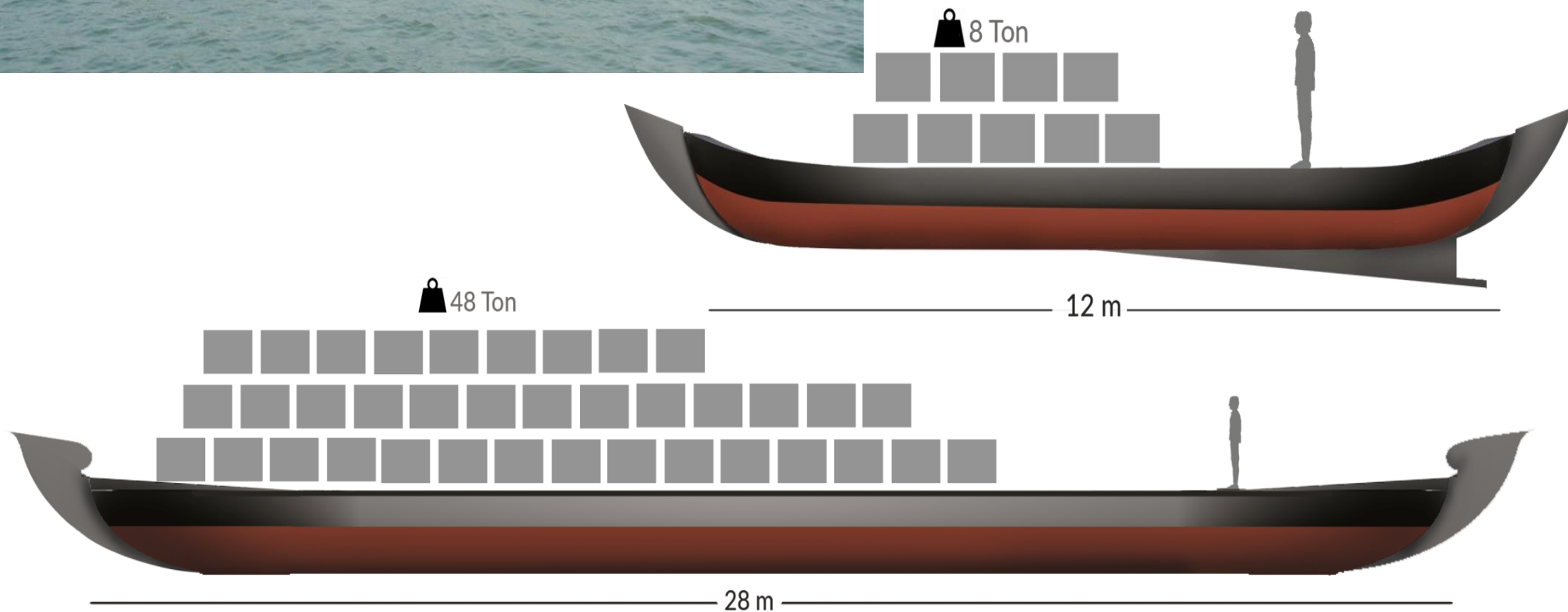
Passive safety - River Information System (RIS) and

Digital Global Positioning System (DGPS) For guiding in navigation

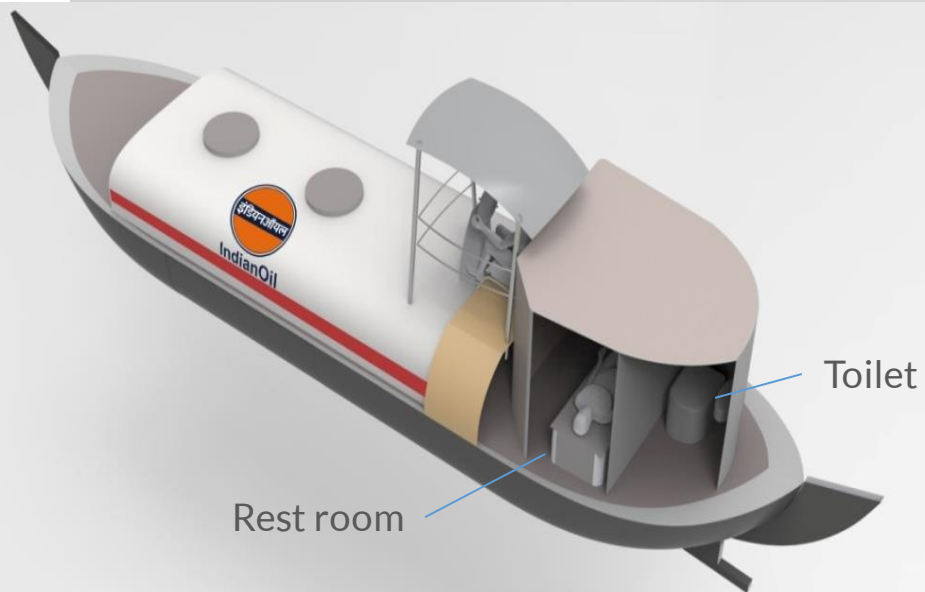
- Sensor for depth and collision alarm.



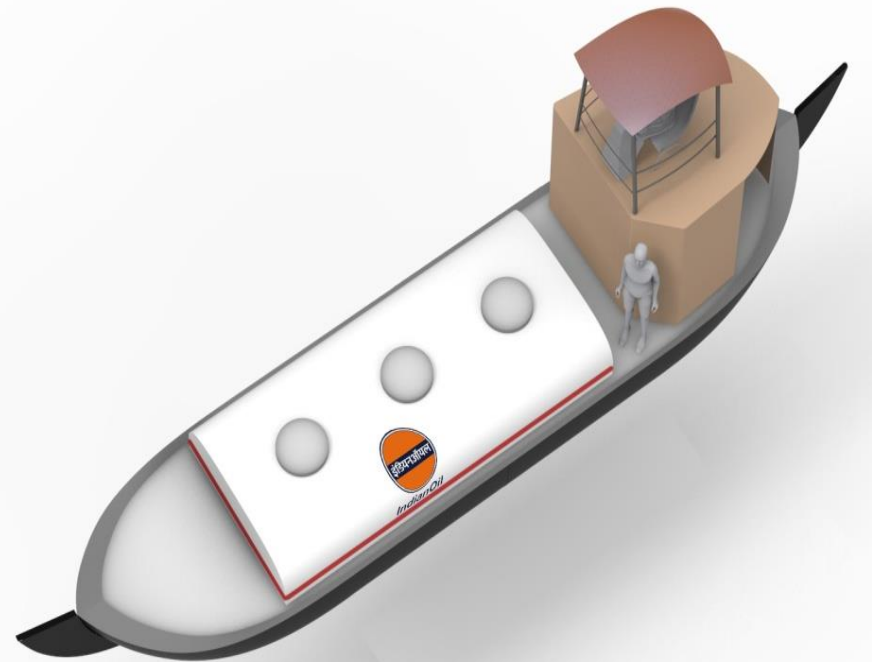
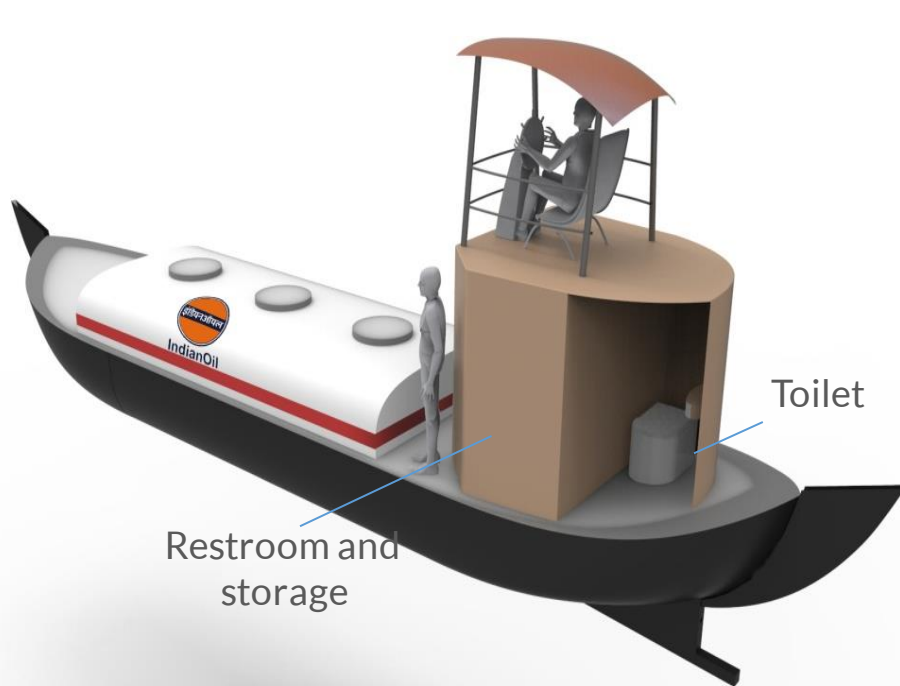
Hull dimensions



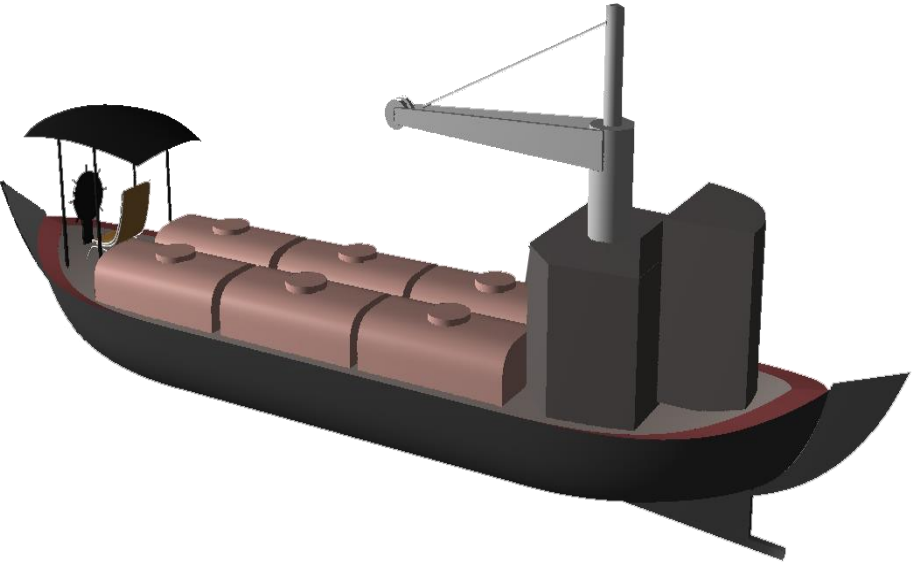
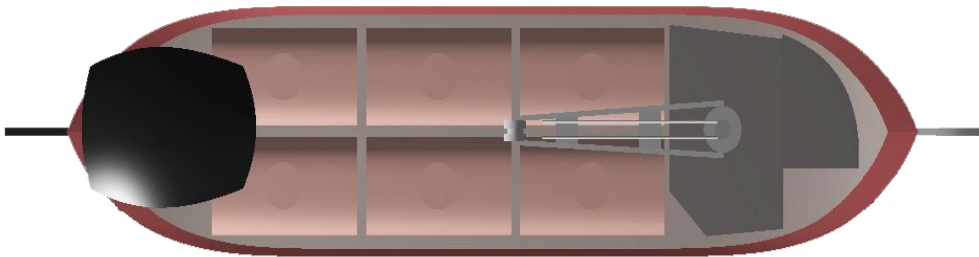
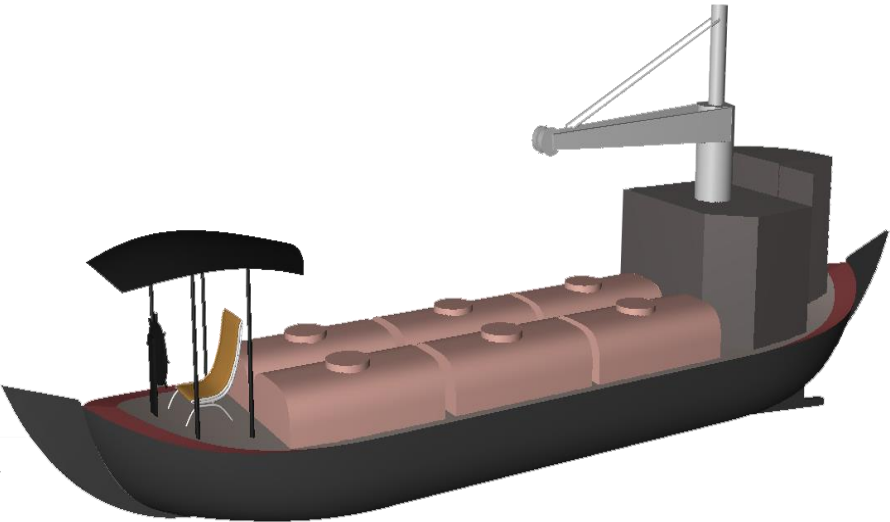
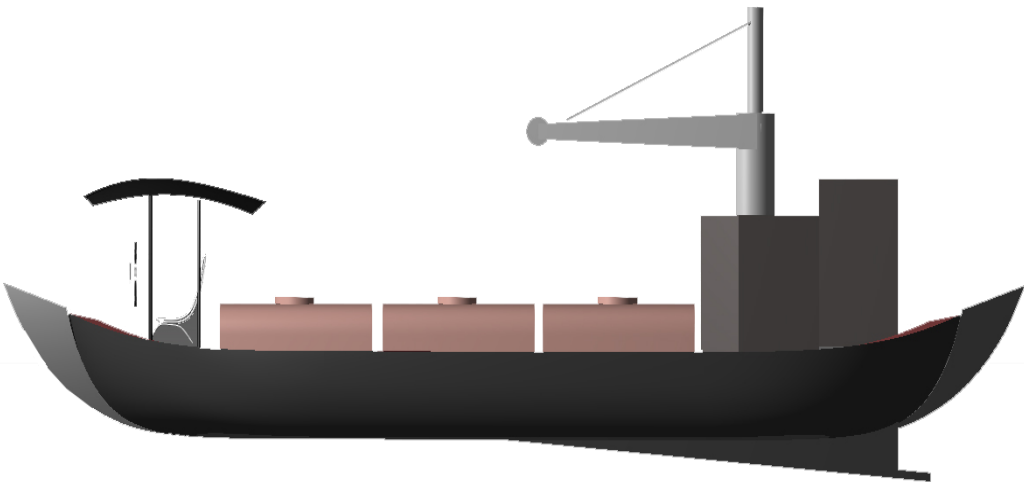
Idea one for 12m hull



Idea Two for 12m hull



Idea three for 12m hull

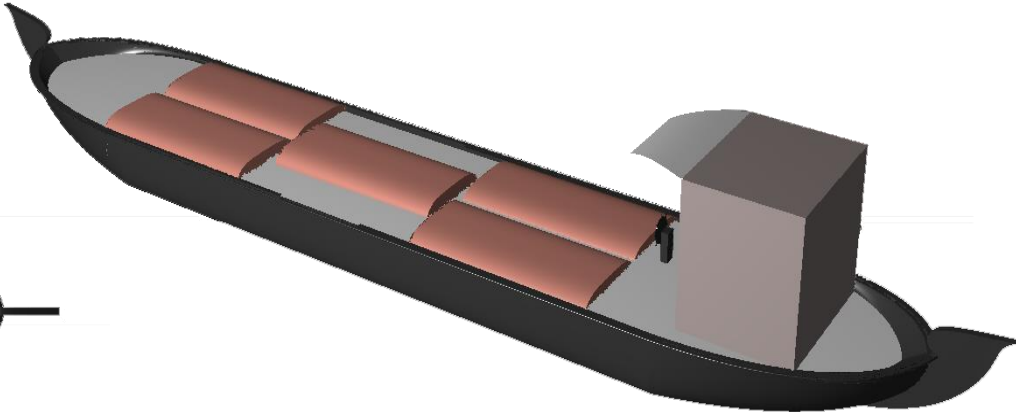


Idea two for 28m hull

Current gas tanks



Engine , sewage
And storage



driver

