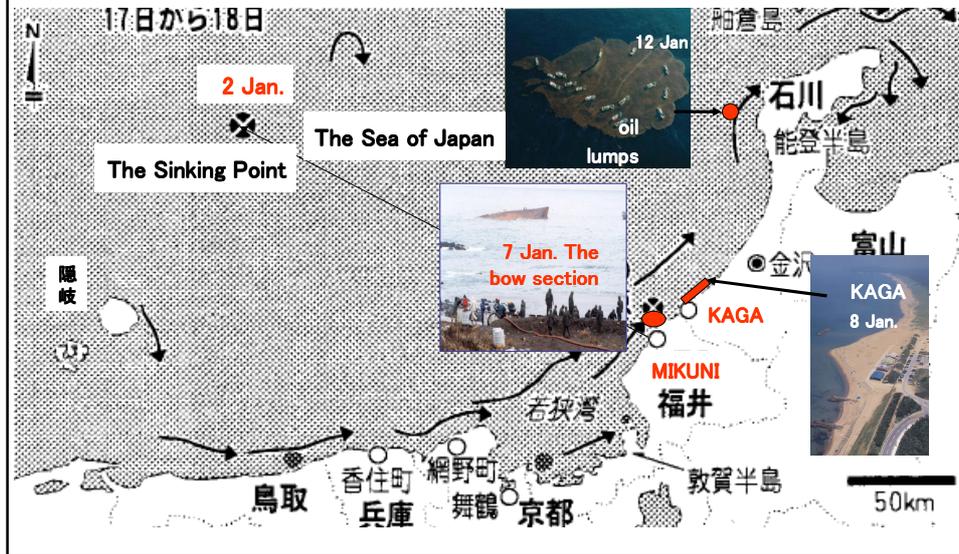
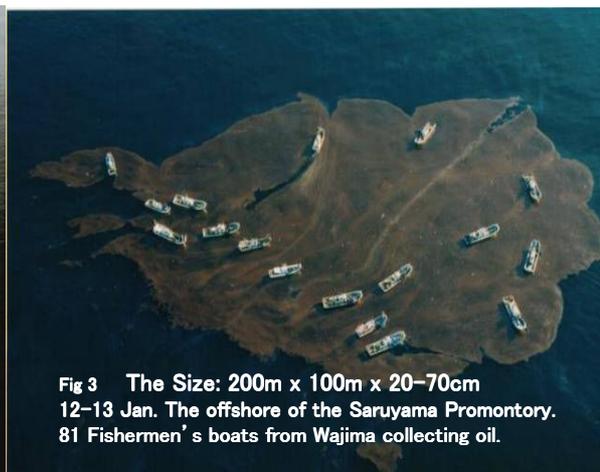
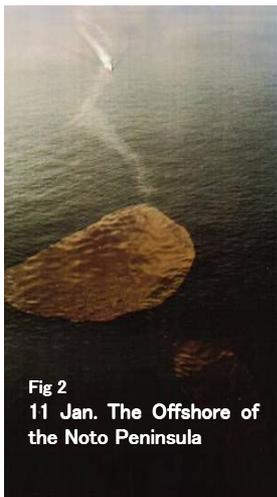


The NAKHODKA Jan 2, 1997



The Massive Oil Lumps in the Western Offshore of the Noto Peninsula. 11-12 Jan.





The Kotobuki Bucket Grab Hopper Barge & the Hakusan, a Research Vessel of Ishikawa Pref. 12, 13 Jan.



It was known that there were massive oil lumps in advance, but.....

- The structure of recovery boats in our hand are not suitable for highly viscous oil recovery operations.
- Further development of techniques of spilt oil recovery with booms is necessary. (Structure of Booms / Training)
- Since the efficiency of a bucket grab hopper barge was not officially known, it was difficult to have an agreement on the increased usage of the barge.
- It took about 3 hours for an aircraft to convey the information to the MDPC regarding the location of the oil lumps, but the information was no longer useful when it was finally received.

Drifted Oil and Manual Recovery Operation on the Beach



The Kaga Beach





Over 3.5 millions volunteers including citizens

w/ tools such as strainers, spatulas/pallets, shovels

10am 12 Jan.

Observation on 6 Mar.

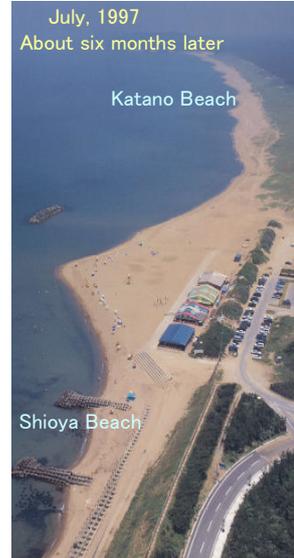
↑ 1m 程の段差

① 舌を出したような油塊
① Oil lump that looks like a sticking out tongue

② ころころ動く油塊
② Oil lumps rolling over

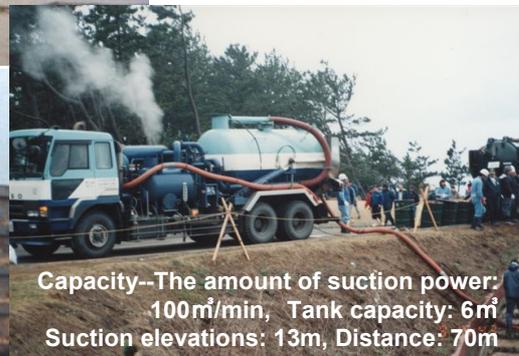
The Kaga Beach

- 5,000 tons of oiled sand → Buried in a landfill site
- Heavily oiled sand → Burnt
- Damage to vegetation → The geographical features of the shore were changed



In the future

- High performance vacuum loaders
- Beach cleaning machines



Capacity--The amount of suction power:
.100m³/min, Tank capacity: 6m³
Suction elevations: 13m, Distance: 70m

Response to a Massive Oil Drift Ashore on the Sand Beach

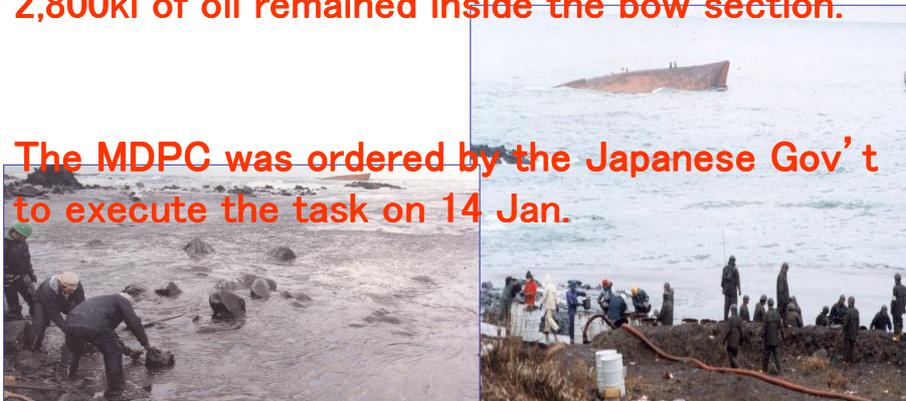
- The usage of heavy machinery caused a massive amount of sand to be mixed with the oil.
- The geographical features of the shore were changed by being moved landward due to damage to vegetation by heavy machinery.
- A massive amount of the beach sand was contaminated with oil, which was wasted and disposed of. However, there were not enough disposal methods or facilities for the oily waste.
- Examination of the most suitable recovery methods --deployments of suction tanker trucks, beach cleaning machines, and etc.



Jan 7, 1997
Mikuni in Fukui Pref.

2,800kl of oil remained inside the bow section.

The MDPC was ordered by the Japanese Gov't to execute the task on 14 Jan.



From the Seaside

During calm sea conditions, the extraction operation was done through the night, 3 times in total. A total of 2,800kl of oil-water mixture was collected.



Construction of the Temporary Causeway

Soil and sand were washed out and eroded by waves, and it took 26 days for the causeway to be completed.

The morning of 23 Jan



The extraction of the remaining oil. 15 Feb

Removal of the bow section



Countermeasures to the Remaining Oil Inside the Bow Section

- Extraction is commonly conducted by connecting a hose between the wrecked/grounded vessel and the ground, and pumping out the remaining oil inside the vessel.
- In the case of the other incidents that require a construction of a causeway to collect spilt oil in the future, objectives and problems should be clearly stated.

Conclusion

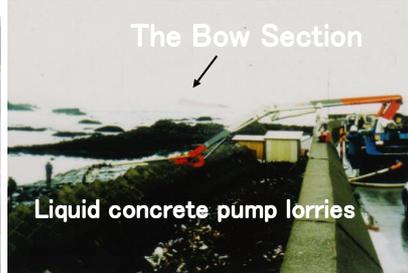
1. We need to establish a system to obtain information about the location and other details of massive oil lumps in advance so that we can surely recover them.
2. Countermeasure systems to deal with a massive amount of oil to be washed up on the beach.
3. Extraction of the remaining oil in the grounded vessel...
It should be considered whether to use the same operational method. All these problems occurring due to the construction of the temporary causeway must be clarified.

The above measures are to be taken in the early stages of the incident, which could be in upset condition. Therefore, they need to be written in a manual beforehand.

Eminent performance was shown by these machines and reservoirs for spilt oil recovery

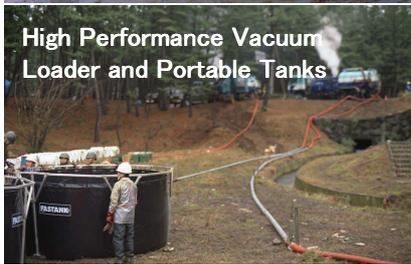


Temporary Pit 2,700kl

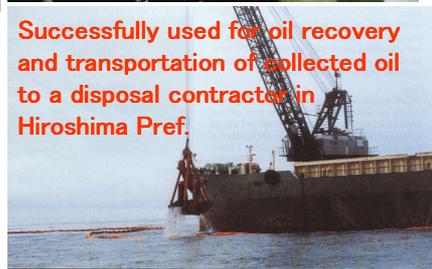


The Bow Section

Liquid concrete pump lorries



High Performance Vacuum Loader and Portable Tanks



Successfully used for oil recovery and transportation of collected oil to a disposal contractor in Hiroshima Pref.