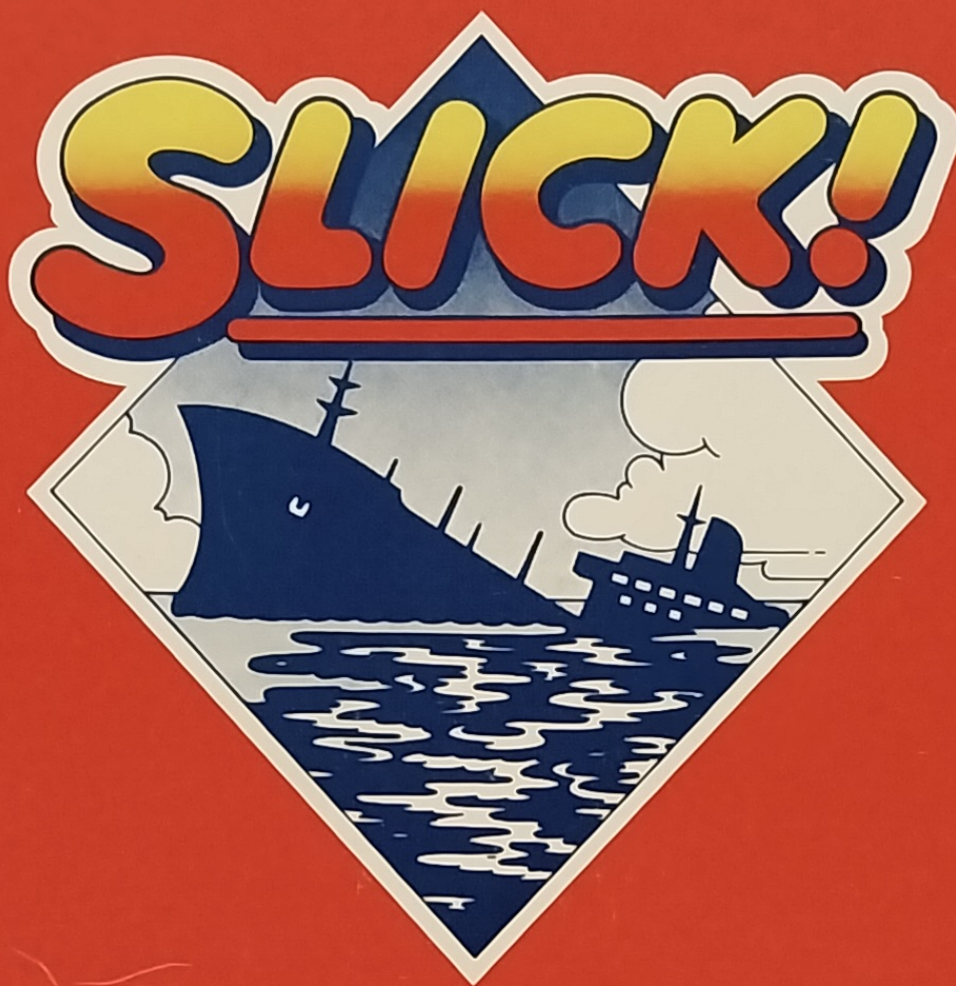




A CONSERVATION GAME

BP Educational Service
in conjunction with Bath University School of Education

In 1976 BP Educational Service and Bath University published *North Sea Challenge* – a multi-media pack dealing with the impact of technology on society. One of the case studies in this pack – *Slick!* – was particularly successful. This present conservation game has been specially developed from the original exercise to appeal to a younger audience. We believe that its teaching value is high and that the exercise gives children an opportunity to think for themselves about an important and topical subject.

OIL SLICK
MARKERS
(four)

ORDER FORM
(one pad)

COUNTERS
(forty-eight)

TEACHER'S NOTES

Slick! investigates the ever-present threat of oil pollution around our coasts. It gives students the opportunity of dealing with an oil slick near an environmentally sensitive part of the coast. *Slick!* can be used at various levels in schools. For advanced students it can form the basis of an examination into decision-making in the modern world. For other groups it provides an introduction to logical thinking. It also gives a simple introduction to grid referencing, compass and map reading to less able students. Its main aim is to let students make decisions in a 'real-life' context. The game is played in groups and is in two parts.

BRIEFING
SHEETS
(four)

TUGS
(four)

DATACARDS
(four sets
of six)

TEACHER'S
LEAFLET
(one)

AUDIO CASSETTE
TAPE (one)

SLIDES
(twelve)

GAME CONTAINER

SLICK! PART 1

The class is first divided into four groups. The game is introduced by a short tape/slide presentation about oil pollution. Each group is then issued with a Briefing Sheet. A letter on the front of the Briefing Sheet informs students that they are Mr McTaggart, a local oil pollution officer. It also states that Mr McTaggart (and therefore the group) has £5000 to spend on anti-pollution measures in case there is an oil spill. The centre pages of the Briefing Sheet show a map of the area under concern. A tanker route lies to the east of the bay and so preparation for a spill is vital. Details on the map show the area to be a sensitive one – wild life, fishing grounds and tourist beaches are all present. The back of the Briefing Sheet gives more useful details.

When each group has read the letter and studied the map, one set of six datacards is issued to each group. The front side of these cards gives information about the various anti-pollution methods and how oil moves at sea. The backs are used in Part 2 of the game.

The datacards are colour coded so that each group receives a different coloured set. In Part 2 of the game, groups should be issued with counters and tugs which are similar in colour to their datacards.

Students spend up to 30 minutes deciding which methods they will purchase with their budget. After 20 minutes each group is issued an Order Form on which they can record their decisions.

WHAT TO DO

Part 1 (45 minutes)

1. Introduce idea of the exercise
2. Show the oil pollution slides with the audio cassette commentary
3. Issue a copy of the Briefing Sheet to each group
4. After five minutes issue a set of six datacards to each group
5. After 20 minutes issue an Order Form to each group
6. Collect completed Order Forms and write up groups' choices on blackboard

SLICK! PART 2

Students hand in their Order Forms. Each group is now issued with a number of counters representing the different methods.

If a group chooses Dispersant it is given 12 counters.

If a group chooses Absorption it is given 8 counters.

If a group chooses Sinking it is given 8 counters.

Each group is also given one tug and one oil slick marker. The tug must be placed in position at the harbour with the counters *beside* it.

Students should find the datacard of their chosen method and use the instructions on the reverse of the card in this part of the game.

Students should also have datacard 6 in front of them.

Each group's decision will now be tested. They will be given details of an oil spill and they must deal with it using the methods they chose.

They must plot the path of the oil spill using datacard 6 and try to deal with it. An audio cassette gives the position of the oil spill (coordinates 5936) as well as a weather forecast at half minute intervals. Each half minute represents $\frac{1}{4}$ hour of game time.

Note: When a group reaches the oil slick marker it should place its tug on the marker. Oil slick marker and tug are then moved together according to weather details.

The 'winner' is the first group to deal with the oil and get its tug back to the *Tug Ready* position in the harbour.

WHAT TO DO

Part 2 (45 minutes)

1. Explain that groups must now deal with an oil spill
2. Issue each group with 1 tug, 1 oil slick marker, a number of counters (8 counters for sinking or absorption, 12 for dispersant)
3. Explain that the audio cassette will give details of the spill, weather forecasts and the time
4. Remind groups to use datacard 6 to move the slick. Groups must always move the slick first, then they can load, move their tug or unload. Details are on the back of the relevant datacard.
5. Ensure tugs and counters are in position at harbour
6. Switch on audio cassette and leave running
7. Check that groups are plotting well
8. Switch off tape when complete and begin discussion

During discussion after Part 2 of the game each group should be called upon to give an account of what happened in both parts of the exercise. It will be found that groups choosing sinking and dispersing can return to the harbour having dealt with the slick – but sinking is not a recommended method (see notes below). Deployment of booms, skimmers and local task forces is theoretical and can be discussed with groups when the exercise is finished.

Each group should justify their decisions, either as a group or through a spokesperson chosen from among them. It will simplify matters if groups are asked to work through their decisions in the following framework:

- What were seen to be the main areas of the Bay in need of protection? How were these priorities arrived at?
- Which methods were chosen to combat the oil spill and how were these choices made?
- How were decisions made during the actual spill? Who took charge?

Absorption is not recommended, as some groups will have found to their cost, except for very small spills. There is not time in the present emergency to use this method. In fact application would have been difficult if not impossible as there is a high wind and strong breeze during the early part of application. One of the main disadvantages of absorbent is the fact that it is difficult to apply in bad weather.

Even if the absorbent were applied successfully there would be problems in collecting the oily mass.

Sinking has serious disadvantages although the oil could be sunk well before it comes ashore. This would, however, be at the possible expense of a proportion of some fishing revenue as sinking would have to take place over or near to the important fishing grounds. Shell fish would probably be tainted for some time and even if there were not proven adverse effects, the public would probably refrain from buying fish in the area. This happened after the 'Torrey Canyon' spill when fish that were in fact unaffected were shunned by worried customers. Sinking would also foster uncertainty about whether the oil had been successfully dealt with. Underwater currents could carry it weeks later either onto the shore or to other areas of the fisheries.

Dispersant is probably the best choice. High tide on the morning in question can be given as 0800 hours so that dispersant in the water would be carried away from the shore and diluted harmlessly in the estuary. Some dispersant will have to be sprayed fairly close to the shore but this is a risk which must be taken.

Burning should have been rejected early in the exercise after reading the Briefing Sheet. It is a difficult method to use fraught with problems and dangers.

Beach cleaning at a cost of £4000 is not a recommended solution. Oil is best dealt with at sea. Heavy oil deposits on beaches are reported in the



press and could deter holiday visitors, even if the beaches are cleaned up within a few days. This happened at several holiday centres in Brittany after the 'Amoco Cadiz' disaster.

Local task force. This is a useful back-up for each of the main methods. There are bound to be remnants of oil and a trained local task force can deal quickly with any small pockets of oil that do come ashore.

Booms. There are three major areas where booms might be used. These are in the harbour, the river and the marina. As the town flourishes on the fishing industry it is suggested that the harbour is the most important area to be defended. Booms might also be deployed in front of rocks or a small beach in order to deflect the spill to a less sensitive region.

The merits of such actions would have to be individually considered at the end of the exercise. A boom placed in the path of a slick may trap the oil but unless a **skimmer** is used quickly before the winds change the oil could move quickly away again in a different direction. As the skimmer is only available during office hours there would be some delay in obtaining one for the present emergency.

POINT OF THE EXERCISE

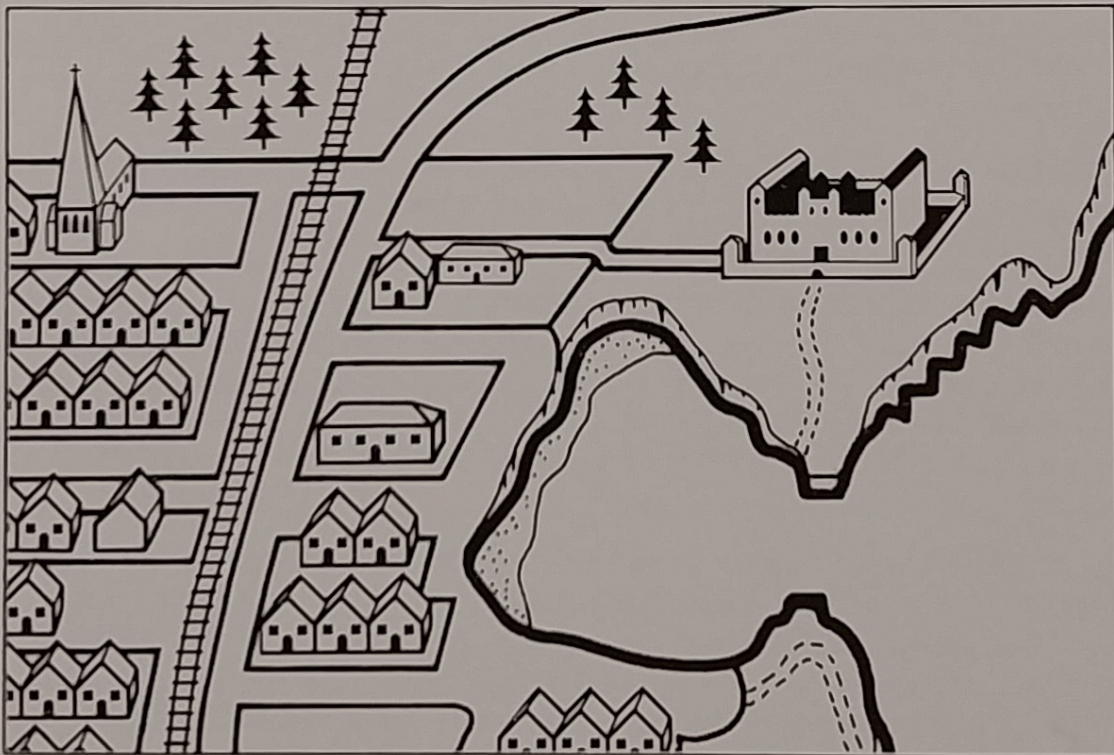
Nobody wants oil pollution. But we all want oil. We want oil for our cars, our factories, for our planes and ships, and for the wealth of consumer products that oil makes possible. But as long as we want oil we must face up to the threat of oil pollution.

Hopefully this exercise shows some of the problems we face in trying to combat pollution. It is not an easy task. Accidents will happen.

None of the methods available in this exercise offer a foolproof solution. Use of dispersants is probably the best method – it is the one favoured by Britain in her fight against oil pollution. But it still has problems. Spraying dispersant close to shore in Northsands Bay could have bad effects on the shell and crab fisheries. And there will be at least some work for a local task force.

What the exercise should show is that we must be prepared for emergencies. We must find out the facts and make good decisions based on the information we have available.

In emergencies people tend to panic. How did your students react to the enforced time schedule? Did a leader emerge? Did the group work well together? These kind of questions can be investigated further and lead onto project work. And if students liked the exercise and think they could do better given a second chance, why not make up a new weather forecast and let them try again!



FILMSTRIP COMMENTARY

SLICK! – a conservation game

This is a sound tape accompanying *Slick!* – a conservation game, a decision-making exercise published by BP Educational Service and Bath University School of Education.

(pause)

This side of the tape is in two sections. The filmstrip commentary for the 12 slides in the pack is followed by the timebase for the game. The reverse side of this tape is blank.

(pause)

FILMSTRIP COMMENTARY

(bleep)

1. Our modern world is dependent on oil. Huge tankers are one way in which oil is transported across the oceans of the world. This beach lies close to existing tanker routes from the Middle East to Europe. Its shore life, its seabirds, its value as a holiday beach – are all vulnerable to oil.

2. And this is the same beach after a large oil spill. In 1967 the 'Torrey Canyon' ran aground near the Scilly Isles and the world was made aware of the amount of oil carried by the then new 'super' tankers. 'Torrey Canyon' was a tanker of only a hundred and eighteen thousand (118 000) tonnes. Today there are tankers afloat four times that size.

3. One method of dealing with an oil spill is to burn it. Freshly-spilled oil *can* be ignited. But there is a danger that the tanker causing the spill may be destroyed. Oil that has been at sea for some time and is some distance away from the tanker will not burn easily and in any case burning pollutes the air. It's not a recommended method.

4. Oil can be sunk – treated sand discharged onto the surface of a slick sticks to it and drags the oil down to the seabed. Oil is removed from the surface but is not removed from the marine environment. Underwater currents may deposit the sunken oil ashore weeks after the incident.

5. Another method is the use of dispersants. Dispersant is sprayed onto the oil from spray booms attached to the sides of a tug. Slats of wood – rather like five-barred gates – are towed behind the tug to mix the dispersant with the oil. The

dispersant breaks up the oil into smaller parts. The increased surface area increases the rate of natural degradation.

6. A number of porous materials are available which will *absorb* oil. Polyurethane, straw and peat can be used and these are spread onto the oil, usually by hand. When they've had a chance to absorb some oil they are collected, transported ashore and burned.

7. Oil close to the coast presents problems. Fishing areas, wild-life sanctuaries, holiday beaches are all vulnerable. Sensitive areas can be protected by booms. A boom is a floating barrier and these inflatable rubber sections can be strung together across harbour entrances and across sensitive sections of the coast.

8. Oil collected against booms can be removed by a mechanical skimmer. This device skims the oil from the surface of the water by means of a series of rotating blades. Then the oil is carried by a rubber hose into a storage vessel. Oil removed in this way can be treated and re-used.

9. Once oil is on the beaches a number of methods may be used. One method is the use of a mobile beach buggy. This acts rather like a tug at sea – but spraying dispersant *over the beach*. Beach cleaning is expensive – but so is a lost tourist trade.

10. This Cornish harbour was once in the path of an oil slick. The methods discussed could have saved it from extensive pollution. By tracking the movement of oil on water, slicks can be monitored and tugs sent to deal with them quickly. But there is not always time.

11. This is what the fight against pollution is about. When this happened we were not prepared for massive oil spills, but today our coastline is supervised by Local Pollution Officers, and oil companies and government departments work closely together to minimize the risks to our environment.

12. Oil and its products can benefit all mankind but many problems still remain because we are working at the limits of man's technological knowledge. Countless decisions will have to be made – and it's up to all of us to make sure that the decisions continue to be the right ones.

(pause) ►

TIMEBASE

HERE IS THE TIMEBASE FOR SLICK! – a conservation game

(Dialling tone)

Ah! Mr McTaggart? Oil Pollution Officer? This is Inverlochen coast-guard. Yes. Well, I'm sorry to wake you this time in the morning but we've just had a call from a tanker. There seems to have been a collision and there's oil leaking into the sea. No, I don't know any more details yet.

(pause)

Yes I have. Have you got the map there?

(pause)

Well, the centre of the slick is reported at coordinates 5936. Have you got that – 5936. Oh, they estimate they've lost about 100 tonnes. Yes, yes. Right, we'll keep you informed Mr McTaggart. Good night then.

(5 secs)

The time is now 0100 hours. Here is the weather forecast until 0115 hours. Winds slight. From the SE.

(half minute)

The time is now 0115 hours. Here is the weather forecast until 0130 hours. Winds slight. From the SE.

(There are now half minute intervals between each weather forecast)

The time is now 0130 hours.
Winds slight. From the SE.

The time is now 0145 hours.
Winds slight. From the SE.

The time is now 0200 hours.
Winds gentle. From the SE.

The time is now 0215 hours.
Winds gentle. From the SE.

The time is now 0230 hours.
Winds moderate. From the E.

The time is now 0245 hours.
Winds moderate. From the E.

The time is now 0300 hours.
Winds gentle. From the SE.

The time is now 0315 hours.
Winds moderate. From the SE.

The time is now 0330 hours.
Winds moderate. From the SE.

The time is now 0345 hours.
Winds fresh. From the E.

The time is now 0400 hours.
Winds high. From the E.

The time is now 0415 hours.
Winds strong. From the NE.

The time is now 0430 hours.
Winds moderate. From the NE.

The time is now 0445 hours.
Winds moderate. From the NE.

The time is now 0500 hours.
Winds moderate. From the N.

The time is now 0515 hours.
Winds gentle. From the N.

The time is now 0530 hours.
Winds gentle. From the NE.

The time is now 0545 hours.
Winds slight. From the NE.

The time is now 0600 hours.
Winds slight. From the NE.

The time is now 0615 hours.
Winds gentle. From the E.

The time is now 0630 hours.
Winds gentle. From the E.

The time is now 0645 hours.
Winds slight. From the SE.

The time is now 0700 hours.
Winds slight. From the SE.

The time is now 0715 hours.
Winds slight. From the SE.

The time is now 0730 hours.
Winds gentle. From the SE.

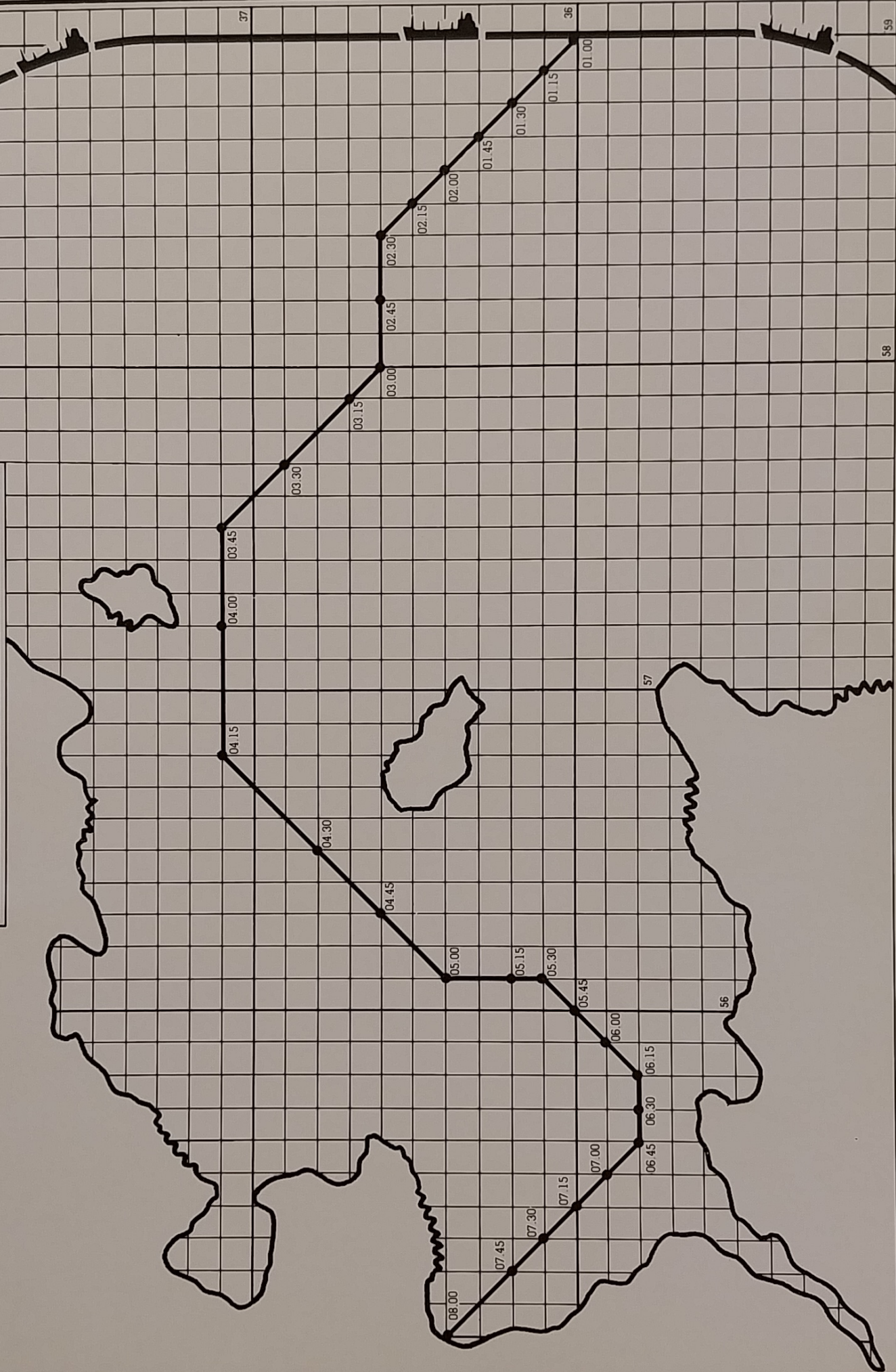
The time is now 0745 hours.
Winds moderate. From the SE.

(pause)

That is the end of the weather forecasts. Here is a newsflash. We have just heard that an oil tanker has run aground and a large oil slick is approaching the Scottish town of Inverlochen.

(fade out)

PLOT OF OIL SLICK



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