

WESTERN GRAY WHALE ADVISORY PANEL
7th Meeting
PUBLIC

WGWAP 7/8
12 – 14 December 2009
ENGLISH

Progress report on outstanding oil spill-related issues including 2009 Sakhalin site visit
Submitted by: Dicks

Review of Sakhalin Energy's Oil Spill Response Plans and Response Resources Report of Site Visit to Sakhalin Island, 5th - 12th October 2009

Brian Dicks, GWAP Panel Member

Summary of Findings

1. Following visits to major oil spill response equipment stockpiles at Nogliki PMD and the Prigorodnoye LNG Terminal, I was impressed with the high standard of the storage facilities and the high quality and maintenance of the response equipment and of the personnel who maintain and deploy it. The oil spill response resources held by SEIC now meet the requirements for response at sea and on shorelines as specified in the OSRPs.
2. Wildlife capture and clean up facilities located at the Prigorodnoye LNG Terminal are excellent and both the equipment and wildlife capture and clean up procedures are consistent with good international practice. 40 trained response personnel can deal with 70 oiled birds a day and up to a total of 500 birds can be accommodated in the facilities. Bird hazing equipment is also available, but currently is only sufficient for deployment over about a kilometre of marsh or shoreline. It is recommended that hazing devices are increased substantially in number because they have the potential to reduce the numbers of oiled birds at relatively low cost. As yet, there are no facilities to handle oiled seals, and it is recommended that the handling of the oiled seals to be incorporated into the plan and that appropriate procedures, equipment and facilities are prepared.
3. After reviewing the risk of crude oil spillage to the east of Aniva Bay from possible tanker traffic along shipping lanes through the Kuril Islands, it appears unlikely in the extreme that the normal patterns of weather and sea conditions would result in spilled oil being able to reach the gray whale feeding grounds near Piltun. Consequently there is no justification or need for further detailed modelling of spills in this area and I believe it would be sensible to close recommendation GWAP 4/018.
4. Adequate arrangements for both the temporary storage of oily wastes generated by clean up and for their final disposal appear to be in place. Provided Sakhalin Energy's understanding with the Russian local authorities of the availability of adequate temporary

storage sites is correct, it seems likely that waste handling procedures would be effective and would be unlikely to result in any bottlenecks for clean up operations, and therefore have no implications for the gray whales or their feeding grounds.

5. The poor quality of the dirt roads which are the only land access to shorelines in the gray whale feeding areas remains a concern, both for clean up and for the transport of oily wastes. Sakhalin Energy believe that there is adequate availability of suitable vehicles to cope with these roads (large trucks, 4WD vehicles etc.) and equipment for repairing the roads such that this would not be a major problem.

6. Sakhalin Energy has a comprehensive oil spill exercise and training programme, conducted at all the equipment stockpiles each year, and in the command centre in Yuzhno. However, in my view there is an important omission from the programme to date. No drills have been carried out on shorelines near the gray whale feeding grounds. It is recommended to focus some drills in these areas, and would help alleviate concerns over dealing with the poor quality of the dirt roads which are the main access routes. This would allow testing of the best means to get resources and personnel to these areas, and supporting them once equipment is deployed.

7. In order to keep the Panel up to date with exercises and training, the provision of a list of exercises conducted and planned and brief summary reports of each drill would be valuable at each GWAP Panel meeting, and would meet recommendation GWAP 4/020.

8. Sakhalin Energy have provided all of the documentation requested at GWAP 6.

Brief comments on each are as follows:

- Supporting documents for the OSRPs related to environmental monitoring totalled more than 1,500 pages and proved to be a summary of the company's compliance with regulatory requirements for environmental monitoring, dealing with wastes, and requirements for data storage and handling. They contained little of relevance to gray whale interests.
- The Handbook for Monitoring and Assessment of OSR Operations provides good guidance for monitoring the effectiveness of spill clean up operations, but is much less helpful on the subject of environmental sampling and what might be needed

after a spill to monitor impacts. In my view Sakhalin Energy need to clarify the purpose of this document. Sakhalin Energy note that they have included post-spill whale monitoring in the marine mammal protection plan, but the details have not been reviewed here. Given the importance of post-spill monitoring in the context of the gray whales and their feeding grounds, this subject would benefit from further consideration at Panel meetings.

In addition the following documents were provided:

- Master Equipment Lists for cross-referencing with OSRPs and in support of the stockpile visits described above. They appear consistent with the OSRPs and what was seen in the oil spill response equipment stockpiles at Nogliki PMD and the Prigorodnoye terminal.
- Dispersant Forum Protocol: The document summarises discussions between scientists and regulators around limiting dispersant application to waters deeper than 10 metres and preferably away from whale feeding areas.
- Manual for Oil Spill Clean Up in Ice. The company provided us with a draft of a guidance manual describing response techniques. As it stands it is not a practical manual setting out Sakhalin Energy's policy, techniques and the equipment and approaches but a general review of the subject.

9. Consistent with recommendation WGWAP 6/024, further analysis of aromatic compounds in Vityaz crude is in hand, to be completed by a protocol similar to the European NORDTEST method. The company is investigating laboratories which can conduct the analysis.

10. Spill response in ice. This item was discussed during the site visit and it is understood that other than the preparation of the ice response manual noted above, there has been no other change to OSRPs or the status of responding to winter spills. Because of the difficulties of oil spill clean up in ice, this subject should remain under regular review by the Panel.

Review of Sakhalin Energy's Oil Spill Response Plans and Response Resources Report of Site Visit to Sakhalin Island, 5th - 12th October 2009

Brian Dicks, GWAP Panel Member

Introduction

Following reviews of Sakhalin Energy's Oil Spill Response Planning documents (OSRPs) in 2007 and 2009 by GWAP Panel member Dicks, two members of the Panel (Tsidulko and Dicks) and a representative of IUCN (Larsen) visited Sakhalin Island between 5th and 12th October 2009 with the aim of updating the Panel's knowledge of oil spill preparedness and response and dealing with a number of issues which were raised by the reviews and at GWAP meetings (GWAP 4 – GWAP 6). Equipment stockpiles at the SEIC LNG Terminal at Prigorodnoye and Nogliki Pipeline Maintenance Depot (PMD) were visited. Discussions were held with operational and response staff of SEIC and Ecoshelf, the contractor appointed to store, maintain and operate the spill response resources. The oil exploration and production area was also visited by helicopter (this was combined with an SEIC whale carcass survey), and shorelines and lagoons likely to be affected by spills were observed directly.

The main objectives of the visit were as follows:

- To review equipment present on site by visiting storage and maintenance facilities and compare with OSRPs.
- To review oily waste handling procedures and visit the main disposal site at Smirnykh.
- To take part in an equipment deployment drill.
- To review training, exercises, and understanding and implementation of the OSRPs with the response staff; to be conducted at Yuzhno and whilst visiting stockpiles.
- To discuss and resolve any outstanding OSRP review issues.
- To learn any further details of the spill at the PA-A platform in 2007.

Prior to the visit a list of visit objectives and issues to be discussed and resolved had been prepared.

Not all of the above proved to be possible and some alternatives were substituted which, in my view, allowed the main aim of a comprehensive review of response facilities to be completed satisfactorily. In practice, it proved impossible for Panel members to fit in with PCCI's visit and a spill exercise in late September. Instead, that exercise and a range of earlier drills were reviewed in discussion with Sakhalin Energy's response staff and by viewing comprehensive collections of photographs and video footage. Time requirements also made it impractical to visit the Smirnykh waste handling site and it was agreed in advance of the visit that photographic and technical information on the site could be substituted. In advance of the site visit, it was also agreed between Panel representatives, IUCN and Sakhalin Energy that, from a practical perspective, the operations at Smirnykh, provided they have reception capacity for oily waste which would be unlikely to be exceeded, have limited direct relevance to protection of the whales. Consequently it is more important to review waste handling procedures from potential clean up sites and along the waste handling routes to Smirnykh to assess whether any bottlenecks were likely which might impair clean up operations which could have a direct impact on the whales. This was the focus during the visit.

The following items (which have arisen during the OSRP review and WGWAP discussions) were also raised with Sakhalin Energy during the visit (not in any order of priority) for clarification and resolution:

- The status of recommended additional analysis of aromatic compounds in Vityaz crude.
- The status of additional spill trajectory modelling for Aniva Bay, requested at WGWAP 4.
- The status of the company's exercise/training programme to date and what is proposed for the remainder of 2009 and 2010.
- Provision of documents related to environmental monitoring (see recommendation WGWAP 6/023). *It should be noted that* recent Panel meetings have raised the issue of monitoring of the Piltun Lagoon and the scope of post-spill monitoring there, but I believe this would be covered more effectively during VanBlaricom and Tsidulko's proposed visit to Vladivostok to meet the Sakhalin Energy environmental monitoring team.
- The status of field trials of in-situ burning, bioremediation and any further field trials of laboratory wave-tank studies of oil behaviour and properties.

- Spill response in winter/ice. Review any progress made by SEIC in tracking research and whether any changes have been made to response options or the OSRPs.
- Review the visit by lenders representatives in September 2009 and any issues/comments which they may have raised from the recent drill.

Visit Schedule

Discussion meetings and site visits were made on the following schedule:

6th October: Morning - Preliminary meeting with Sakhalin Energy to review documentation needs, the provision of photographs and video footage of drills etc., and preliminary review of Aniva Bay modelling; Afternoon - IUCN Stakeholder meeting (Finn Larsen to report).

7th October: Visit to Prigorodnoye oil spill response equipment stockpile and discussion meetings with response staff regarding exercises, drills, training and oily waste handling procedures. Visit to wildlife response centre and demonstration of oiled wildlife clean up resources and hazing equipment.

8th October: Travel to Nogliki camp. Whale carcass survey flight and overview of lagoons and beaches from Nogliki airfield, along the coast to the northern part of Piltun Lagoon.

9th October: Visit to oil spill response equipment stockpile at Nogliki Pipeline Maintenance Depot (PMD) and discussions of exercises, drills and training with Ecoshelf personnel who maintain the equipment. Return to Yuzhno

10th October: Visit to Sakhalin Energy offices to obtain all the agreed documentation, photographs and video footage and discuss waste disposal procedures.

11th October: Review of documentation, photographs and video footage.

12th October: Close out meeting with Sakhalin Energy.

The outcome of the various meetings, discussions and visits is set out below.

Acknowledgements

The site-visit team acknowledge the commitment and efforts of Sakhalin Energy's staff, who made travel arrangements and organised permissions for the site visits and helicopter overflight. This made it possible for Panel and IUCN representatives to achieve maximum benefit from the visit. Thanks are also due to GWAP Chairman Reeves for constructive criticism and vetting of this report.

1. Review of oil spill response equipment Sakhalin Energy's oil spill response equipment stockpiles at Nogliki PMD and at the Prigorodnoye Terminal in Aniva Bay were selected for inspection because they contain substantial and varied stockpiles of oil spill response equipment and they were expected to be representative of the company's other stockpiles.

On inspection, it was clear that the resources were well stored and were in excellent condition. Checks of equipment listings at the bases (from the Master Equipment List - see Section 6 below) with those in the OSRPs showed the plans to be consistent with what is actually on site. Storage facilities are spacious and appeared to be well maintained, as did the equipment. A comprehensive series of photographs of the equipment available and its condition were taken at the stockpiles, and these are held by IUCN. It should also be noted that Sakhalin Energy engage OSRL in Southampton to make an annual audit of the stockpiles on site.

The staff who maintain the equipment and would deploy it in the event of a spill (both Sakhalin Energy's personnel and the staff of Ecoshef, who manage the stockpiles) appeared familiar with the equipment for which they are responsible, and had received comprehensive training in spill response and the requirements of the OSRPs (see 3. below). In discussion it was clear that they are well aware of the technical merits of the resources as well as the limitations for use of the various items and the limitations and safety concerns which result from poor weather, winter conditions and ice. They explained the maintenance schedules for the resources and the regular starting and testing of motors, hydraulic systems and all mechanical equipment.

A lot of equipment is containerised for forwarding to a spill site or to vessels for deployment. Some shoreline response equipment is in trailers ready for rapid deployment. A criticism which arose from my last inspection was that shoreline equipment for manual response (shovels, rakes, waste bags, etc.) was in limited quantities, and this has been rectified.

Small response vessels (both inflatable and rigid hull) and engines appeared to be well maintained and engines are regularly tested. Most of the vessels are on trailers,

complete with all the usual ancillary and safety equipment, and are ready for rapid deployment. One concern arose from the inspection which relates to equipment and small vessels which were on or in trailers for rapid deployment. The trailers were standard road trailers which would typically be for use on metalled roads. They have limited ground clearance and relatively small wheels and light suspensions. Whilst they would be fine for the metalled roads on Sakhalin, many of the northern shorelines are accessed along dirt roads, many of which are in poor condition or which deteriorate in bad weather. Response staff were aware of these concerns, and they believe that they have adequate resources available (loaders, fork lifts, small cranes) for transferring boats and other equipment to trucks with four-wheel drive and suitable ground clearance which would be able to negotiate these roads.

The concern over the quality of the dirt roads and their potential impact on clean up operations in my view remains significant. Whilst numerous spill drills and exercises have been carried out by the company, none have been carried out in these remote areas (see Section 5 below). Whilst Sakhalin Energy personnel are aware of this concern, and seem confident about their ability to deal with these roads, the acid test can only be a spill - drills in these areas will also assist and are strongly recommended.

Overall, I was impressed with the standard of the storage facilities, the quality and maintenance of the response equipment and the quality of the personnel who maintain it and would be expected to deploy it. The oil spill response resources held by SEIC now meet the specifications set out in the OSRPs and meet the needs for response at sea and on shorelines as specified in the plans. Shoreline response resources have been improved since the last visit and are now considered adequate to meet the response scenarios set out in the OSRPs.

2. Wildlife response Wildlife capture and clean up facilities were demonstrated to us at the Prigorodnoye terminal. Dedicated equipment is available for the capture of oiled birds, and trained personnel, including vets to assess the suitability of a bird for cleaning, are available to clean them using internationally approved procedures and then rehabilitate them for release. A section of an indoor equipment workshop is dedicated for assessing and cleaning birds, and outside areas are designated for containers to accommodate the animals once cleaned. The system can receive 70 birds a day and

can accommodate 500 birds in total. There are 40 people on Sakhalin who are trained to capture and handle oiled birds. We were provided with summary documentation of Sakhalin Energy's wildlife response resources and procedures, and these are held by IUCN. These are well written, easy to understand and are consistent with good international practice. Nonetheless the capacity of the wildlife rehabilitation facilities in Prigorodnoye may become a concern during migratory seasons in spring and fall as the number of oiled birds may exceed 500.

Hazing (bird scaring) equipment was also demonstrated, which included bird cannons, hand held air horns and fixed and inflatable 'scarecrows'. This equipment would be deployed in and around oiled areas of marsh or shoreline to keep birds away and prevent them becoming oiled. Units available were sufficient for deployment over only about a kilometre of marsh or shoreline, and it is recommended that these be increased substantially in number because they have the potential to reduce the numbers of oiled birds at relatively low cost.

As yet, there are no facilities to handle oiled seals, and should receive consideration by the company.

3. Additional spill trajectory modelling for Aniva Bay Recommendation WGWA 4/018 requested further modelling of possible spill movements from vessels loading at Aniva Bay that might route eastward through the Kuril Islands to access markets in Central or South America. The recommendation was premised upon the possibility that a spill to the east of Aniva Bay would have the potential to route northwards to the gray whale feeding grounds, and that this possibility had not been modelled in Sakhalin Energy's risk assessments during preparation of the OSRPs. The likely collision or grounding locations in the Kuril Islands would be at points where shipping channels pass between the islands, so these would be the most likely origin points for a spill. Sakhalin Energy confirmed that gas tankers have used those routes, but that so far export crude had not passed through them. However, the company agreed that crude oil transport through or along those routes is possible, and that further consideration of oil spill trajectories would be beneficial.

During the summer of 2009 I exchanged correspondence with the company, and following provisional discussions at the start of the site visit it became clear that spillage which might occur in the western-most Kuril channels would be most likely to affect the Kuril Islands and Japanese territories to the south, and that any impact on Sakhalin would be close to Aniva Bay and well to the south of the Mys Terpeniya peninsula. Summer currents and winds would be unlikely to allow oil in these areas to migrate northwards. Whilst a spill in this area may not affect the Sakhalin gray whale feeding grounds, the Kuril Islands are on potential gray whale migration routes and there are many other environmental concerns in the islands which Sakhalin Energy would be unwise to ignore.

It was also clear that general current patterns which are southwards along the east coast of Sakhalin during summer would make northwards movement of spilled oil highly unlikely. Sea ice in winter would also make northward migration of oil unlikely.

To help clarify the risk that a spill further to the east in the Kuril Islands might present to the gray whale feeding grounds, I made some simple calculations based on an empirical oil trajectory model used by the International Maritime Organisation and the spill specialists, ITOPF and OSRL. Oil moves on the water surface at 100% of the current speed in the direction of the current and at about 3% of the wind speed in the direction of the wind. Accepting that currents are generally weak along the east coast of Sakhalin and generally flow southwards in summer, the main force which would be required to move oil north-west would be wind. The likely spill location in the Kuril Islands is some 500 nautical miles south-east of the gray whale feeding areas and postulating a steady 30 knot wind from the south-east, a spill would require about 23 days to travel 500 nautical miles. Given that the surface currents in summer run against this, and that the likelihood of such a prolonged period of strong south-east wind is remote in the extreme, then the possibility of oil reaching the gray whale summer feeding ground is highly unlikely. The highly volatile nature of Vityaz crude would also make it unlikely to persist on the water surface for more than a few days, and for it to remain as a coherent slick for more than 20 days is not supported by fate calculations. Consequently, there is no justification for further detailed modelling of spills in this area and I believe it would be sensible to close recommendation WGWAP 4/018. However, whilst the Sakhalin gray whale feeding grounds may not justify further consideration of spill modelling in the

Kurils, other environmental sensitivities in this area may justify further consideration in the OSRPs (e.g. the presence of right whales and a variety of birds and other wildlife plus the presence of commercial fisheries).

4. Handling of oily waste Handling of oily waste following a spill is generally focussed initially on temporary storage somewhere close to clean up operations, followed by the material in temporary storage being transported onwards for final disposal. Temporary waste handling and storage needs to be well managed to prevent any interruption to spill clean up, and, generally over a longer period, transfer to final disposal sites can be completed. As noted above, it was agreed in advance of the site visit between Panel representatives, IUCN and Sakhalin Energy that, from a practical perspective, the operations at Smirnykh have limited direct relevance to protection of the whales, provided the reception capacity for oily waste was deemed adequate. Consequently the focus was on reviewing waste handling procedures from potential clean up sites and along the waste handling routes to Smirnykh to assess whether any bottlenecks were likely which might impair clean up operations and thereby have a direct impact on the whales.

Temporary storage The Prigorodnoye terminal at Aniva Bay has a temporary storage area for 'dirty snow' on site, and this could be adapted for temporary storage of oily waste. It comprises a hard standing of 10,400 m². Neither the PMD's nor the OPF at Chayvo or Nogliki have any temporary storage capacity on site.

However, Sakhalin Energy reported that they have reached agreement with local authorities to construct temporary waste storage sites adjacent to clean up operations, provided environmental criteria are met. For example, they cannot be constructed in nature reserves or on sites of special biological interest. The company believes that, consistent with this requirement, temporary storage sites could be positioned at many locations along most of the coast near their operations where spills might occur. As a result, Sakhalin Energy's response managers do not believe temporary storage would pose a potential hold up to cleaning. This can, of course, only be tested should a spill occur, but Sakhalin Energy report that Rosneft have done this for a minor spill without problem.

There is still a concern over the quality of the dirt roads which are the only access routes to much of the coastline in the gray whale areas, but whilst this may slow transport and result in high costs for waste transport and temporary road repairs, there is adequate availability of suitable vehicles and the roads would be unlikely to present a significant problem for waste handling.

Final Disposal Sakhalin Energy provided a composite photograph of the Smirnykh site and the receiving capacities of the various handling areas at the site. The information provided is as follows:

The Smirnykh Oily Waste Handling Area is divided into three parts by earth dams. Area #1 is intended for storage of low contaminated soils (< 15%), area #2 is for storage of highly contaminated soils (>15%), and area #3 is for bioremediation and water collection. These areas are reported by the facility to be:

Area #1 = 0.60 hectare

Area #2 = 0.17 hectare

Area #3 = 0.10 hectare

If one assumes that oily waste can be stored two metres deep, these represent 12,000 cubic metres for Area #1 (approx. 25,000 tonnes of oily sand), 3,400 cubic metres for Area #2 and 2,000 cubic metres for Area #3. These capacities would increase if storage to greater depths is feasible. The composite photograph shows bunds around these areas to be in excess of four metres, so a greater storage capacity seems likely. In my view, these capacities would be unlikely to be exceeded, except perhaps in a truly major spill. In such a scenario, wastes may be held for longer periods in temporary storage to allow final disposal to be completed.

Overall, provided Sakhalin Energy's understanding with the Russian local authorities of the availability of adequate temporary storage sites is correct, it seems likely that waste handling procedures would be effective and would be unlikely to result in any bottlenecks for clean up operations, and therefore this issue should have no implications for the gray whales or their feeding grounds.

5. Review of exercises, drills and response training During the site visit, Sakhalin Energy provided us with a detailed matrix of oil spill training, drills and exercises, as well

as photographs and video footage of drills (including the most recent one, in September 2009, which was attended by PCCI). They also provided a copy of an internal report of a recent drill in 2009 for review on site.

The video footage and photographs, which are held by IUCN, showed many aspects of spill exercises, ranging from the operations within control centres to the deployment of personnel and response equipment to rivers and beaches, including in ice. These appear to have been conducted well and to have resulted in the deployment of ocean-going booms and skimmers from OSRVs, and the deployment of booms, skimmers and clean up crews to beaches, rivers near pipeline crossings, and along pipeline routes. The videos show them to have been conducted in similar fashion to drills world wide and I have no criticism of these efforts. The most recent exercise, in September 2009, was attended by PCCI on behalf of the lenders, and a lot of the video footage was of this drill. At the time of the visit it had not been collated into a final review of the drill, but nevertheless proved adequate for me to assess what had been carried out. The company have agreed to provide the Panel with a DVD summarising the drill once it is available from their contractors, which is anticipated to be before WGWAP 7.

The summary report (2 pages) of a drill involving equipment deployment to a shoreline was concise, to the point, listed things that went well as well as what went wrong, with suggestions for improvements and a couple of photographs of key items. It is understood that such reports are prepared for all drills and exercises. In contrast, the matrix of training, drills and exercises which was provided to us proved difficult to understand and interpret. In order to keep the Panel up to date with exercises and training, the provision of a list of exercises conducted and planned and brief summary reports of each drill would be valuable at each WGWAP Panel meeting, and would meet recommendation WGWAP 4/020.

Overall, Sakhalin Energy has a comprehensive oil spill exercise and training programme, conducted at all the equipment stockpiles each year, and in the command centre in Yuzhno. However, in my view there is an important omission from the programme to date. No drills have been carried out on shorelines near the gray whale feeding grounds. And it is recommended that some drills are conducted in these areas, which would help alleviate concerns over dealing with the poor quality of the dirt roads which are the main

access routes for clean up equipment and for transporting oily waste. This would allow testing of the best means to get resources and personnel to these areas, and supporting them once equipment is deployed. Whilst there may be concern over disturbance to wildlife which drills might cause in these areas, because they usually last only a day or two it seems likely that the potential benefits would outweigh any short-term disturbance.

6. Review of additional documentation requested at WGWAP 5 and 6 Prior to this site visit, Sakhalin Energy had agreed to provide supporting documents for the OSRPs related to environmental monitoring, which had been identified in the OSRP review as potentially relevant and were consequently requested by the Panel at WGWAP 6. These documents comprised four volumes totalling more than 1,500 pages. They proved to be a summary of the company's compliance with regulatory requirements for environmental monitoring and dealing with wastes, both onshore and offshore, plus requirements for data storage and handling. They contained no details of the programmes which are actually being conducted by the company or of what might be carried out after spills, so they appear to be of little value for further Panel consideration.

In addition Sakhalin Energy provided the following documents:

Master Equipment Lists for cross-referencing with OSRPs and in support of the stockpile visits described above. They were useful during the site visit and appear consistent with the OSRPs and what was seen at Nogliki PMD and Prigorodnoye terminal.

Dispersant Forum Protocol: The document provided summarises discussions held 26th February 2009 between scientists and regulators around limiting dispersant application to waters deeper than 10 metres and preferably away from whale feeding areas. The document reveals little of Sakhalin Energy's policy and preferences for dispersant use, which have already been discussed and agreed in principle between the Panel and the company. I see little benefit in pursuing this issue further, given the progress already made during Panel meetings.

Manual for Oil Spill Clean Up in Ice. The company provided us with an early draft of their manual for responding to oil spills in ice. This proved to be a general guidance manual describing potentially useful response techniques, and not a practical manual setting out

Sakhalin Energy's policy, techniques and the equipment and approaches they would employ. In this form it falls well short of what might be regarded as an operational guidance document. In my view the Panel should monitor the development of this manual and follow the subject of response in ice closely, given that many Panellists, including me, have reservations about what might in reality be achieved during a winter spill (see also Section 9 below).

Handbook for Monitoring and Assessment of OSR Operations. As requested at GWAP 6, this document had been provided to the author and IUCN 26th August 2009. It makes a general review of the subject and draws heavily on the OSRPs for its content. Whilst it provides good guidance for monitoring the effectiveness of spill clean up operations, it falls well short of what might be expected in relation to environmental sampling and what might be needed after a spill to monitor impacts. For example, no guidance is given to what biological or chemical sampling Sakhalin Energy might conduct after an oil spill, and no mention is made of the need for critical involvement of scientists in designing post-spill monitoring or how comparability of post spill data with pre-spill monitoring data might be achieved. In my view Sakhalin Energy need to clarify the purpose of this document, and given the importance of post-spill monitoring in the context of the gray whales and their feeding grounds, this subject would benefit from further consideration at future Panel meetings and in the EMTF.

7. Status of field trials (in-situ burning, bioremediation and any further field trials of laboratory wave-tank studies of oil behaviour and properties) In general terms, and as noted by Sakhalin Energy during recent GWAP meetings, further trials related to bioremediation, oil behaviour and properties (including in wave tanks) are not planned by Sakhalin Energy. Trials of in-situ burning is a possibility in 2010. We were unable to obtain further clarification on site and Sakhalin Energy should be able to give a clear statement at GWAP 7

8. Status of additional analysis of aromatic hydrocarbons The request for further analyses was first made at GWAP 4 and resulted in recommendation GWAP 4/017. In due course this was superseded by recommendation GWAP 6/024. The subject was discussed in some detail during the site visit. The recommendation arose mainly from the fact that aromatic analyses carried out by the Leeder Group for Sakhalin

Energy reveal that several aromatic compounds, which are very likely to become important in an oil spill to both fisheries and whale interests, had not been adequately quantified, and that more sensitive analyses by gas chromatography and mass spectrometry would be appropriate. During this visit and by e-mail correspondence immediately after, the scope and form of further analyses were agreed as follows. The analyses should be consistent with gas chromatography/mass spectrometry procedures accepted in Europe and North America for aromatic analysis. A suitable procedure would be that specified in NORDTEST, a European protocol agreed internationally and coordinated through the Norwegian government specialist laboratory SINTEF. SEIC has since expressed a preference to conduct the analyses in Russia, China, Japan or Korea, and I have passed along details on a laboratory in Korea which I understand to be suitably qualified. Sakhalin Energy is expected to be in a position to report progress at WGWAP 7.

9. Spill response in ice This item was briefly discussed with Sakhalin Energy, but it is understood that other than the preparation of the ice response manual noted above, there has been no other change to OSRPs or the status of responding to winter spills. Whilst the review of the equipment confirms the availability of some high quality and robust pumps and skimmers which would be applicable to oil recovery in ice, and that the company continues to discuss in-situ burning as an option with the regulators, I remain of the opinion that an effective clean up of a large spill in winter conditions would be extremely difficult. The limitations imposed by the harsh conditions mean that clean up would be unlikely to be completed effectively until the spring thaw, even allowing for the volatility of Vityaz crude oil. Because of the difficulties of oil spill clean up in ice, this subject should remain under close review by the Panel.

10. Lenders visit to spill exercise in September 2009 and additional information on the small spill at PA-A platform in 2007 Sakhalin Energy believe that PCCI thought that the exercise in September 2009 was well run and effective, but as yet have had no formal feedback from PCCI. It would be useful if the company could provide this in due course.

No further details were learned of the PA-A Platform spill in 2007. Sakhalin Energy believe that they reported on this incident to the Panel and that as it was a minor spill of only 40 litres there is nothing further to report.

Brian Dicks

3rd December 2009